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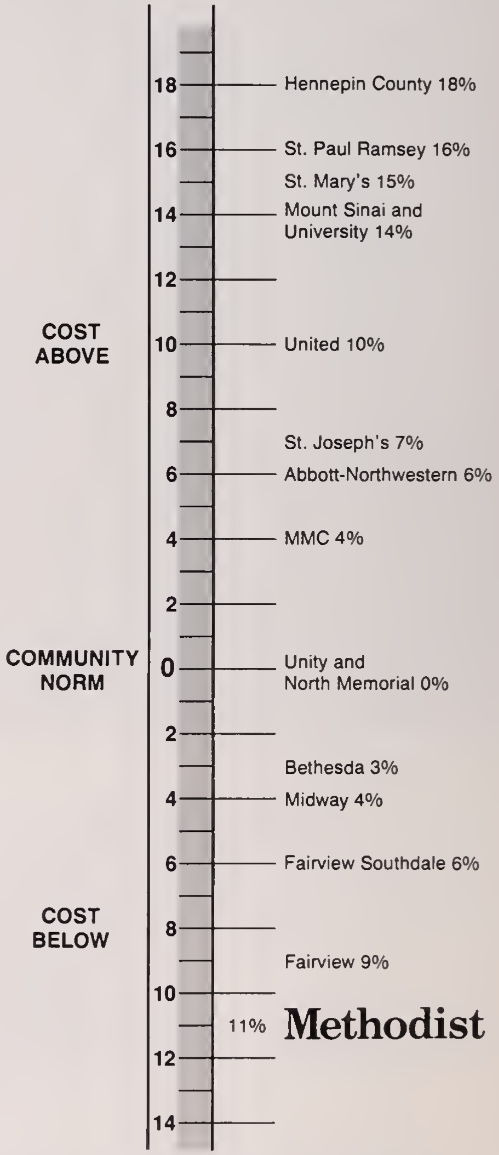

Hospital price levels by percent above and below the community norm for hospitals of 200 beds or more.*

*Source: Minnesota Department of Health. Data from St. John's Hospital being reviewed

Methodist Hospital

President's Letter

Smoking: Our Business, Our Responsibility

Peggy Craig

M. Elizabeth Craig, M.D.
President
Minnesota Medical Association

"These leaves make friends and celebrate with gentle rites the vows of peace. They are givers of strength and calm to the vexed and wearied minds of those who build with thought and brain the temples of the soul. Within their magic warp and woof some potent, gracious spell imprisoned lies which, when released by fire, doth softly steal within the inner sanctum of the soul and bind in sleep in the captured sentinals of care and grief. Cuba is the smile of the sea."

These tantalizingly sensual words were written by Robert Ingersoll around the turn of the century, encouraging the use of cigars—the elitist form of tobacco of that day. While the style of tobacco advertising has changed, the appeals are still designed to be tantalizing.

The statistics concerning tobacco use are dramatic. The direct costs of increased health care in Minnesota as a result of tobacco use is $374 million a year, or an additional 80 cents per pack of cigarettes sold in this state. Across the country, over 1000 people die each day as a result of tobacco use. This is the equivalent of three 747 planes crashing each day. **What dramatic public reaction we would have if these deaths had been caused by plane crashes! But, one at a time, they seem to be absorbed into our consciousness with little impact.**

The evidence showing the dangers of tobacco is so overwhelming that we must, as individual physicians—and as a profession—do our part to eliminate tobacco use and save those lives which are now being lost.

Our profession is doing a great deal, especially here in Minnesota. We originated the Minnesota Coalition for a Smoke Free Society by the year 2000, which is still housed in the MMA office and is moving forward successfully. Recently, the AMA has spoken out with a stronger voice about tobacco use.

I have had some wonderful opportunities in the last year to speak to the public about cigarettes and smokeless tobacco. The response by the public to the message I have carried for the physicians in Minnesota has been enthusiastically positive.

It became clear to me that we might often underestimate the value our patients place on our opinions regarding public health issues.

A recent survey showed that greater than 60 percent of tobacco users would stop or seriously try to stop using these products *if* their personal physician recommended and supported such an effort.

Our role as the patient's advocate requires us to voice our concerns about public health issues such as smoking—to our individual patients and to the public as a whole. **Our adversary, the tobacco industry, is powerful. Our patients are vulnerable.**

It *is* our business to counsel our patients about tobacco use and also challenge each of our colleagues still puffing. And particularly, we must work to counter the efforts of the tobacco industry and their tantalizing appeals to seduce our youth into their camp.

Many of my colleagues have offered compliments on our efforts with smokeless tobacco. Yet, should we be complimented for meeting our professional responsibilities? Talking with our patients about the dangers of tobacco use—and supporting our patients who wish to quit—*is* a responsibility you and I have. It is a responsibility which must be fulfilled both in the office and through our joint efforts as an organization.

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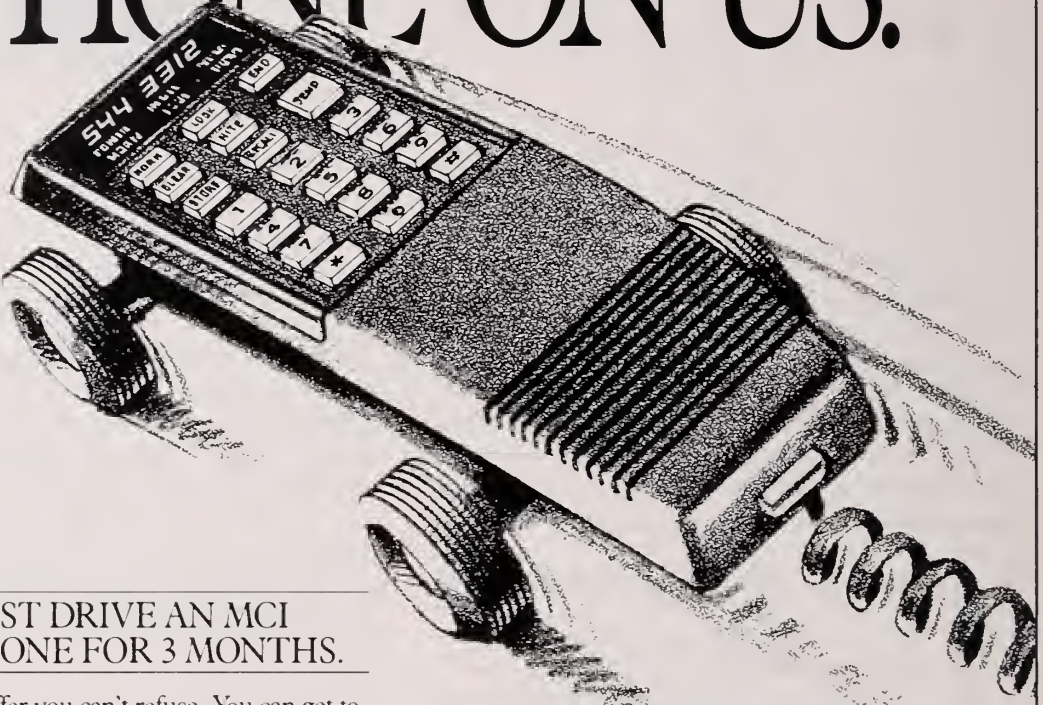

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Editor's Notebook

Corporate Transformation of Medicine in Minnesota:

Have Twin Cities' HMOs Peaked? And Other MegaQuestions*

15th in a Series

> *"To have the right answer means to have asked the right questions; and the right questions are those which answer themselves."*
>
> C. Northcote Parkinson, Foreword, *Drucker*, Warner Bodes, 1976

St. Paul - Ladies and gentlemen, physicians and spouses, members of the Ramsey County Medical Society.

It is always, of course, a pleasure to be in St. Paul - the most livable city in America, birthplace of Group Health, capital of the State of Minnesota, fiefdom of Mayor George Latimer, transfer point of Rudy Perpich between foreign flights, birthplace of the Winter Carnival, site of the world's largest ice palace, the place to be in Minnesota if you're not in Lake Woebegone, and home of the Ordway Theatre, the Prairie Home Companion, and Garrison Keillor, all slightly above average.

Such a Pleasure

It is such a pleasure to be here that I am reminded of the story of Alfred Kinsey, author of the Kinsey Report, the most comprehensive report on sex ever composed. Kinsey was to give a one hour speech. But after a rambling talk by his introducer, Kinsey was left with one minute to speak on his favorite subject. He arose and said simply: "It's a pleasure." and sat down.

This is the fourth talk I've given in St. Paul in a week. St. Paul is getting so familiar I can even find my way around on even numbered days. On odd numbered days, I give snow jobs like the one I'm about to give you. I don't want to overdo the Minneapolis-St. Paul love affair. It has its city limits. You don't want our loving arms to extend across the river, and you don't want to see our doctor bills either.

A Which Hunt

Times have changed, particularly in medicine. In 1965, I worked as a pathologist at Minneapolis's St. Barnabas Hospital, which merged with Swedish Hospital to form the Metropolitan Medical Center, which then joined with United Hospital and Children's Hospital of St. Paul, to become Health One, which is not the same as First Health, which has merged with two other entities to become something else, the name of which eludes me. My mind is bewhiched at the moment. These days you have to go on a which hunt to find which is which, and which is what.

The Only Game in Town

In any event, in 1965 Group Health was the only HMO game in town -

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*Presented before the Ramsey County Medical Society, November 25, 1985, Town and Country Club, St. Paul, Minnesota.

MedCenter, PHP, SHARE, and HMO Minnesota were not even a glimmer, a gleam, or a glint in a planner's eye. Indeed, Paul Ellwood had not even coined the word "health maintenance organization." If he had it to do over again, he wouldn't use that word, for, as even he admits, HMOs have almost nothing to do with health, and even less to do with maintaining it, but everything to do with money, marketing, and management, or as Paul likes to say, "with reshaping the health care dollar," i.e., redirecting the cash flow from physicians to organizations. In 1965, we had close to forty independent hospitals. Today you can count the independent hospitals - those without a merger or a linkage or an outside owner - on one hand. Indeed, the bets are we'll only have four surviving hospital systems in five years. Some of the mergers now being rumored are: Abbott-Northwestern and Health Central, Methodist and St. John's, Health One and Fairview, North Memorial and each of the preceding, and all possible combinations of the above.

The Trouble with Trends

All of these changes and rumors are the consequence of trends within our society. If we had been smart enough to anticipate or confirm them, we would be either rich, retired, or majority stockholders in United Health Care Systems or American MedCenters or Prudential, which has a deal going with Group Health that will provide coverage for 370,000 Minnesotans. But the trouble with trends, as Winston Churchill once remarked, is that it is hard to look into the future further than you can see. So, if you expect me to speak this evening on the future, or megatrends, you've got the wrong man.

MegaQuestions

Instead, I will try to answer six megaquestions that have been perplexing me recently in travels as a consultant. A consultant, as you know, is charged with asking the big questions rather than giving small nettlesome answers.

At my house, I ask questions like: "Shall we drop the bomb on Red China?," rather than deciding where the next mortgage payment is coming from or what car we might buy. My wife decides the miniquestions. Deciding what questions to ask is important. Peter F. Drucker, the father of modern management and the most famous consultant of them all, puts it this way: "Effectiveness is finding the right questions to ask; efficiency is finding the right answers." At the turn of the century, an effective man might have asked: "How can we share the future of the motor car industry." An efficient man would have asked: "How can we make buggy whips faster and cheaper."

My job tonight, as I see it, is to pose the right questions, and to try to answer them.

1. What stage are we at in the evolving health care marketplace in the Twin Cities?

According to the September, 1985 Saloman Brothers Investment Newsletter, HMOs in the Twin Cities are at stage two. The wisdom of the Saloman Brothers says that stage two is when HMOs achieve 30 percent market penetration in a metropolitan area. Well, we passed that in September of 1983, and we're now at about 42 percent market penetration. What happens at stage two? HMO profit margins begin to decline; HMO patients become an important source of hospital inpatients; HMOs use this increasing share of hospital inpatients as leverage to pressure hospitals for discounts.

In addition, other things begin to happen. Growth becomes harder to sustain, and HMOs expand into nonmetropolitan areas. Patients for HMOs and hospitals both become scarcer, so HMOs begin to either affiliate with private doctors or to buy their practices out. Growth sucks up capital, and HMOs form for-profit holding companies to get money for growth. When that doesn't raise money fast enough, doctors in HMOs take paycuts, or their salaries are put on hold.

The competition - private fee-for-service doctors, hospitals, and Blue Cross and other indemnity plans - get smarter. Doctors begin to market, to network with their colleagues and their hospitals. Hospitals begin to strike up joint ventures with physicians, and Blue Cross forms something called Aware Gold with features of both private practice and HMOs, and with competitive or lower rates than HMOs.

Simultaneously, hospitals and HMOs begin to integrate, horizontally and vertically, to assure their local markets, to keep patients flowing into their organizations, and to exploit their products and gain national market share.

What stage are we at in the Twin Cities' marketplace? We are at the *Multiple Option Stage*. HMOs and fee-for-service carriers are going to have to offer multiple insurance options to thrive. Those organizations that will grow will offer HMOs, PPOs, fee-for-service, other forms of insurance, and multiple hybrids as yet unnamed.

2. This leads to my second question: Has HMO enrollment peaked in the Twin Cities?

Here my answer may startle you: I think it has, at least HMOs as we have known them.

This flies in the face of conventional wisdom which says we're headed towards 100 percent HMO market penetration in five years. We may have 100 percent of physicians working in some fashion with competing entities. But they will not be HMOs as we have known them. Indeed, all the current HMOs are being hybridized; some would say bastardized. All, after all, are now engaged in some form of fee-for-service practice. Exclusivity is in shambles. SHARE has bought back its geographic franchises. PHP has bought out SHARE, and there are rumors Richard Burke wants to capitate all physicians under the PHP-SHARE umbrella. MedCenter has acquired Minnesota Health Network - a PPO. In the latest enrollment of state employees, Aware Gold gained 3,245 enrollees, while Group Health, SHARE and MedCenter lost ground. And, it is an open secret that PHP has been gaining market share at the expense of its own acquiree, SHARE, and of MedCenters and, particularly, of Group Health. Gaining market share comes at a price - the consumption of capital, and therefore, the number of enrollees does not always reflect financial strength.

At this point, I ought to add not everybody agrees with me that HMOs have peaked. There are those who think HMOs will continue to eat up market share in the Medicare and Medicaid market, and at some point, fee-for-service competitors will simply cave in or become meaningless.

3. Why is the character of the HMO movement changing in the Twin Cities?

Well, first off, the price differential for comprehensive services has virtually disappeared. Also, in my opinion, people are beginning to ask questions. And things are beginning to happen in response to these questions. After ten years of HMO experience and exposure to what the small print really means, a few dissatisfied but vocal HMO patients are beginning to surface or to talk to each other or to the television reporters. Hence, the I-Team Report. HMOs are responding by doing more patient satisfaction surveys, by appointing ombudsmen, and becoming more flexible with their contracts.

Also, perhaps most significantly, market research and experience has shown people like to choose their own doctor. PHP, I am told, stumbled onto their "freedom of choice," marketing campaign. It has been a remarkable success. Aware Gold is working the same theme by emphasizing independence and, in their ads, HMO Minnesota, you will notice, doesn't like its doctors on puppet strings. Those plans with independence of choice, so-called HMOs without walls, are gaining, and those with a central organizational structure - even with satellite clinics - such as Group Health and SHARE and MedCenters - are either losing ground or scrambling to make adjustments to the decentralized, multiple option market. MedCenters has tried to counter the problem by adding, acquiring, or buying up practices. MedCenters now employs 370 physicians and has more than 700 physicians within its system.

Businessmen are also asking questions. They are asking: Why aren't the HMOs saving us more money? Why are HMOs content just to be price followers? Why don't we simply fund our own health benefits? Why don't we save money and offer more options by offering higher deductibles and higher copayments? That way, our employees, particularly our higher paid employees, will have independence of choice, won't they? Why do we have to deal with the HMOs anyway? Why don't we deal directly with specialty groups or hospitals?

And doctors are asking questions. They are asking: Why don't we deal with industry and hospitals ourselves? Rather than joining HMOs, why don't we contract with them? Why don't we hire consultants to set the organizational structure and contract with other doctor groups, with hospitals, and with industry? Why don't we set up our own umbrella groups, achieve our own critical mass of management, and strike our own contracts?

4. Why the shift to multiple options?

Many perceptions are changing. Physicians are beginning to realize they are in demand by both hospitals and HMOs. It is dawning on them that the future may be in contract medicine rather than fee-for-service medicine. And it is occurring to physicians that they can strike contracts without going through HMOs. In other words, physicians have become cognizant of their bargaining power. Patients are beginning to realize independence and freedom of choice—to primary care doctors, specialists, and to institutions—are important to them - important enough to abandon first dollar coverage, important enough to choose an HMO without walls, important enough to participate in a self-funding plan of their company's choice. Businessmen are beginning to realize they can save money by means other than HMOs, and their employees want choices other than HMOs. And hospitals are learning that although they, like other sectors of the health care industry, need HMOs, there are other alternatives.

In short, I think there is a lot of innovation and entrepreneurmanship going on in a time of rapid change. I am reminded of Peter Drucker's definition of innovation: "Systematic innovation therefore consists in the purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation." (Drucker, P.F.: *Innovation and Entrepreneurship*, Harper & Row, Publisher, 1985.) The innovations, in my opinion, are outstripping the capacity of the traditional HMOs to handle them. Indeed, in the Twin Cities, we may be entering the third phase of HMO development - namely, the multiple option period in which we don't need HMOs anymore in their present form. To continue to grow, HMOs are engaged in a dizzying race to diversify their products to an increasingly fragmented audience.

5. **Are we entering a period of the resurgence of private medicine in the form of contract medicine?**

Yes, and the professionals who seem to have recognized this resurgence first are the independent health care consulting firms who are doing a booming business and hospital managers who are finding that joint ventures are strengthening their institutions. Joint ventures - between physicians and HMOs, between physicians and physicians, between physicians and hospitals, and between hospitals and HMOs - are up by at least a factor of five in the last year.

Many organizations fighting to adapt are surprised to find that many of the best physicians are still independent or have multiple nonexclusive HMO arrangements. These physicians have what the hospitals want - patients, clinical skills, and the image, skill and authority to market the hospital's services. Physicians also have what the

HMOs want - patients to make the HMO grow and the geographic access to those patients.

6. What's ahead for physicians?

Depends on who you ask and where they live. You can anticipate slightly reduced incomes for Twin Cities' physicians. Why? Well, we have 250 doctors for every 100,000 patients versus 191/100,000 for the rest of the country, and 98/100,000 for nonmetropolitan Minnesota. Personally, I don't think incomes will drop drastically. Physicians will choose to affiliate with multiple HMOs to offset loss of fee-for-service income. Also, I believe PHP-SHARE and Aware Gold will continue to gain market share. Independent physicians who are dead-set against joining in any HMO in any way are in trouble. Flexible fee-for-service physicians who choose to remain in their offices are not.

There will be more joint-venturing. Now is a good time to talk to hospitals because now is the time hospital administrators are hot in pursuit of joint-venture ideas, and now is the time they have the money to invest in joint ventures.

According to John Anderson, who is a consultant with Paul Ellwood, doctors have four choices: (1) "Play" independent. Be an ostrich; do nothing; wait for the pendulum to swing back. (2) Form a coalition with other doctors. (3) Abdicate the market to someone else. (4) Seize the opportunities - join prepaid plans, but avoid exclusive agreements, look for ways to joint ventures with hospitals or other organizations.

For organizations, I see continued consolidation and shake-out.

For the country as a whole, I foresee an entrepreneurial transformation rather than the Ellwood scenario of 15 to 20 dominant supermeds, running 50 percent of the system. I do not see a political swing back to a liberal consensus with heavy regulation or to national health insurance. Many people, particularly Eastern liberals, are pessimistic about competitive forces - saying they will slight the poor, punish academic institutions, and devastate those states with generous programs towards the uninsured. I don't agree. I simply see more innovation with a more decentralized system with a diversity of health benefit packages with less first dollar coverage, more cost sharing, and more emphasis on services offered in ambulatory care settings, like the doctor's office. We will, in short, see a return to physicians' offices. Multiple option organizations who offer these services in physicians' offices will emerge as the most powerful collective force in the Twin Cities' market.

Richard L Reece MD

Cover Photograph

Alaskan Glacier

Dr. William L. Bendel, Jr., M.D., retired pathologist, and his wife were on a cruise on the Pacific Princess (the Love Boat) when they took the cover photograph. The glacier was in an inland passage in Alaska. He used a Minolta SRT 101 with Kodachrome 64ASA film, standard 50 mm. lens, with 1/30 second exposure.

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Thoracic Outlet Syndrome in Cervical Strain Injury

TERRANCE D. CAPISTRANT, M.D.*

Cervical Cervical strain injuries, especially those caused by the "whiplash" flexion-extension injury of rear-end auto collisions are frequently complicated by thoracic outlet syndrome (TOS). The current criteria for diagnosis of this condition are reviewed, and a recommendation made for a more directed treatment approach.

In the past 14 years in a private practice of neurology, I have noted the frequent association of thoracic outlet syndrome (TOS) in cervical strain injury, especially that caused by the typical "whiplash" (flexion-extension) neck movement resulting from rear-end auto accidents. Since 1958 "thoracic outlet syndrome" has been used to describe a common group of symptoms caused by compression of the brachial plexus and subclavian artery and vein, usually between the clavicle and the first rib (Figure 1). "Thoracic outlet syndrome" has now largely replaced older diagnostic terms such as: scalenus anticus, hyperabduction, costoclavicular and cervical rib syndrome. The symptoms include aching pain across the shoulder, in the side of the neck and down the arm. Heaviness, a sensation of weakness, and easy fatigability when using the arm, especially above shoulder height are common. Numbness and tingling, particularly in an ulnar distribution are characteristic. The above symptoms are usually attributed to neural compression. Cold sensitivity, pallor, swelling and temperature aberrations are less common and are thought to be secondary to vascular compression.

A traumatic origin of thoracic outlet syndrome has been well documented in several large surgical series but this complication of whiplash-injured patients was not widely appreciated and I therefore made it the subject of a prior report.[1] That series of 35 cases included those whose T.O.S. symptoms were mild and overshadowed by the strain-injured neck complaints and another group, especially among the more chronic cases, where the T.O.S. became the primary complaint. In the follow-up of these and subsequent patients with cervical strain injuries, T.O.S. has emerged as the most frequent cause of arm symptoms in this injury.

It is surprising that published series of cervical strain (whiplash) injured patients have not emphasized the prominent and often disabling T.O.S. arm symptoms. In a 1973 paper "Neck Sprain," Farbman pointed out the adverse effects of emotional tension, litigation, and prolonged, misdirected, or useless treatment on the healing of cervical strain-injured patients.[2] In this article, arm symptoms complicating the whiplash-injured patient were not mentioned. Balla in a 1980 article "The Late Whiplash Syndrome" reported 300 consecutive patients in Australia with prolonged symptoms following cervical strain injury and found "at some stage almost 40 percent complained of pain in the arm."[3] He listed arm pain as one complaint correlating with the "whiplash" group whose symptoms persisted beyond six months. He did not, however, further comment on the etiology, diagnosis, or treatment of these arm pains. Macnab in a 1971 widely quoted article "The Whiplash Syndrome" listed the arm symptoms of T.O.S. and even accounted for them on the basis of scalenus anticus spasm but did not diagnose it specifically nor suggest any therapy for it.[4]

When one contrasts these articles with the many surgical series of T.O.S., it is remarkable when one remembers that similar patients are being described. For example, Woods reporting on the "Thoracic Outlet Syndrome" in a 1978 article commented that in a 10-year neurosurgical experience with 1,958 soft-tissue neck injuries, 459 (23%) developed a concomitant T.O.S.[5] The "whip-lash"

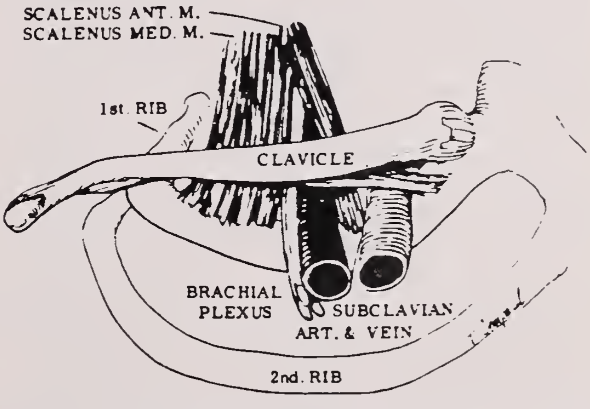

Figure 1 - Relationship of the neurovascular bundle to the clavicle scalenus muscles and first rib. (By permission of ANN of SURG. and author.)

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injury accounted for 44% of these cases. Forty-one percent of his T.O.S. cases failed to respond to conservative therapy and hence required surgery. Martinez also has recently emphasized the major role trauma plays in the development of many cases of T.O.S.[6] Indeed, in the surgical literature, the traumatic cause for T.O.S is so well accepted that the major discussion is not of the association between cervical strain injury and T.O.S. but, rather, which operation or opera tive approach results in the best improvement.

We are then presented with a peculiar diversity of treatment for the patient with cervical strain or whiplash injury who develops T.O.S. In some medical and surgical practices, T.O.S. is not recognized as a complication of cervical strain injury, or is misdiagnosed as "root pain" leading to cervical myelograms, discograms, or CT scans, and at times misdirected treatment, while in still others, T.O.S. is a frequently recognized complication of cervical strain injury, but is associated with an alarmingly high rate of surgical treatment.

In this paper I report an updated analysis of my clinical experience with T.O.S. associated with whiplash and other cervical strains for a 24-month period to emphasize the frequency of this complication with neck trauma, to encourage a directed approach to treatment, and to re-evaluate the current criteria used in making a diagnosis of T.O.S.

Methods

Three hundred sixty-three patient files with an initial complaint of neck pain or arm pain were recalled between September, 1982 and September, 1984. This retrieval was facilitated by a computerized patient data system. One hundred and eleven diagnosed cases of cervical strain injuries and 58 patients with thoracic outlet syndrome were culled from this group and further studied. Clinical evaluation included a pertinent history, especially regarding details of the accident, onset, character, and duration of symptoms, and patterns of referral of pain into the neck, arm and head.

The examination included range of motion testing of the neck, palpation for muscle spasm and tenderness, especially of the paracervical, trapezius, and scalenes, and tenderness of the brachial plexus in the supraclavicular fossa. A brachial plexus compression test was performed in all cases by pressing firmly over the plexus in the supraclavicular area bilaterally for 30 seconds and questioning the patient regarding symptoms. A positive response was the reproduction of an aching sensation and typical localized paresthesias in the arm symptomatic with T.O.S. All patients were tested with a thoracic outlet shoulder girdle "stress test" consisting of shoulders braced and arms in a 90 degree abducted and externally rotated (AER 90 degree) position. If symptoms of T.O.S. did not occur in 30 seconds, patients were asked to repetitively clench and relax fists for an additional 30 to 60 seconds. Radial pulse was palpated and the patient was questioned regarding symptoms. If this test reproduced the symptoms described by the patient in the clinical history, it was considered positive. The Adson test, exaggerated military position and hyperabduction maneuvers were used occasionally. In all of these shoulder girdle stress tests, a "positive test" was one that reproduced the symptoms of the thoracic outlet syndrome, which did not always correlate with a diminution or absence of radial pulse. Electrodiagnostic testing was performed on 35 of 40 cases of traumatic thoracic outlet syndrome. Ulnar F-wave latencies were done in 32 cases using a latency predicting technique described by Weber.[7] Ulnar nerve motor conduction velocity measurements (UNCV) were performed in four cases with stimulation at Erb's point in the supraclavicular area, according to a method previously reported.[1]

A diagnosis of T.O.S. was made on the basis of a typical history with reproduction of symptoms during the exam by one of the shoulder stress maneuvers or a "positive" brachial plexus compression test. Brachial plexus tenderness in the supraclavicular area and abnormal electrodiagnostic testing was helpful but not considered essential for diagnosis.

Results

One hundred eleven cases of cervical strain were found with 84 due to a typical "whiplash" flexion-extension injury and 27 due to other trauma, most often industrial accidents. All the "whiplash" injuries involved motor vehicle accidents, and all but two occurred when the patient was in a vehicle stopped or slow moving, struck from the rear by another vehicle. The 27 other causes of trauma were less homogenous. They included falls, prolonged work with neck in a fixed or awkward position, sudden pushing or pulling incidents, usually involving heavy loads, and one instance of being tossed about in an airplane secondary to heavy turbulance. All cervical strains had symptoms of cervical pain and restricted neck movements, occurring within 24 hours of the trauma. There were 40 cases of T.O.S. among these 111 cases of cervical strain for an incidence of 36% (Table 1). These are termed "traumatic thoracic outlet syndrome." Traumatic T.O.S. was seen in 26 of the 84 cases of "whiplash" (31%) and 14 of the 27 other causes of cervical strain (52%). Eighteen "spontaneous" cases of T.O.S. were seen in the same period of time as these traumatic cases and will not be further considered. There were 32 females and 8 males in the traumatic T.O.S. group with an average age of 30. Bilateral arm complaints were common in many cases by history, but at the time of the examination, only five of the 40 cases of traumatic T.O.S. were clearly bilateral. All of the patients with T.O.S. had arm symptoms of heaviness, aching, easy fatigability and paresthesias usually involving the ulnar distribution of the hand. These symptoms were produced or aggravated by arm use, especially when the arm was used in activity above shoulder level, such as in combing or washing their hair. In one instance, a patient complained of blue mottling of the hand and another of the white appearance. These patients had their symptoms reproduced by shoulder stress maneuvers. Many patients complained that at times their arm felt swollen, but this was never observed on clinical testing and many represent a sensory perversion. A typical pattern of pain referral was to the side of the neck, ipsilateral to the arm complaint and often into the scapula or superior anterior chest on the same side. Neck aches, often associated with headache, were promi nent at some time in the course of every patient with traumatic thoracic outlet syndrome and was absent or minimal in the 18 spontaneous cases of thoracic outlet syndrome. Cervical spine Xrays were available in every case of traumatic outlet syndrome and showed cervical ribs in four cases, a prolonged C7 transverse process in one, with nonspecific changes, such as disc space narrowing and loss of normal lordotic curve, in others. In the 26 cases of T.O.S. associated with whiplash strain injury, 16 were first seen by the author, an average of eight months after the injury (0-21 months) and 10 cases were seen an average of four years (two to 10 years) following the accident. Only one case of cervical radiculopathy with clinical deficits was seen among patients with a "whiplash" type strain injury. Thirty of the 40 cases (75%) of T.O.S. had tenderness of the brachial plexus in the supraclavicular area and often this included the surrounding muscles, especially the scalenus. During the brachial plexus compression test, 36 cases (87%) developed the typical T.O.S. symptoms on the side symptomatic by history. In 38 of the 40 cases (95%), one or more of the T.O.S. shoulder girdle stress maneuvers were positive in reproducing symptoms.

Electromyograms were performed in 35 of the 40 cases of thoracic outlet syndromes with F waves in 32 and ulnar nerve conduction (UNCV) across the thoracic outlet in four. In only two instances was a prolonged ulnar F-wave latency considered suggestive of thoracic outlet syndrome. In the four instances where ulnar nerve conduction velocity was studied by stimulation at Erb's point, one showed the proximal slowing considered typical of thoracic outlet syndrome.

All of the patients in the traumatic thoracic outlet syndrome category had early treatment for

TABLE 1

Clinical Features of 40 Cases of T.O.S. in 111 Cases of Cervical Strain Injury

	Percentage
I. Type of Injury	
1. T.O.S. in 84 cases of "whiplash" injury	26/84-31%
2. T.O.S. in 27 cases of "other" cervical strains	14/27-52%
3. T.O.S. in 111 cases of cervical strains (all types)	40/111-36%
II. Population Features	
1. Traumatic T.O.S. in females	32/40-80%
2. Traumatic T.O.S. in males	8/40-20%
3. Average age traumatic T.O.S.	30 years
4. Traumatic T.O.S. seen "early" after "whiplash"	16/26-62%
5. Traumatic T.O.S. seen "late" after "whiplash"	10/26-38%
III. Clinical Exam Findings	
1. Positive shoulder girdle stress test	38/40-95%
2. Positive brachial plexus compression test	35/40-87%
3. Tenderness of brachial plexus in supraclavicular area	30/40-75%
IV. X-ray and Electrodiagnostic Testing	
1. Cervical ribs in patients with traumatic T.O.S.	4/40-10%
2. Prolonged (UNCV) testing across thoracic outlet	(1/4)-(25%)
3. Prolonged ulnar F-wave	2/32-16%
4. Normal EMG and NCV testing	32/35-91%
V. Treatment Results	
1. Improvement from conservative treatment	18/28-64%
2. Improvement from surgical treatment	7/8-88%
3. Overall successful treatment in 36 cases	25/36-70%

neck pain consisting of the usual conservative physical therapy modalities such as heat, massage and rest. Many of them had cervical traction, especially later in their course. In no case prior to arrival in the office was any specific thoracic outlet syndrome exercises prescribed, despite the fact that the syndrome was suspected in several instances. Treatment by the author was not possible in four of the 40 cases of traumatic thoracic outlet syndrome because the patients were seen for an "independent opinion" only. In the remaining 36 cases, an explanation of the mechanism of thoracic outlet syndrome was given, using anatomic charts. All of the cases had a T.O.S. exercise protocol taught by a certified physical therapist. In 20 cases biofeedback muscle relaxation was given because of the prominent associated neck pain. Surgery was performed in eight cases of traumatic thoracic outlet syndrome, three among the patients with whiplash injury, and five among those with other forms of cervical strain. Surgery was reserved for those cases where T.O.S. was longstanding and severe. The arm symptoms were typically constant or nearly constant and significantly interfered with work or the patient's lifestyle. All of this group were exposed to prolonged directed, conservative treatment modalities prior to surgery. In the seven of eight surgical cases with improvement, not only were the arm symptoms of T.O.S. relieved, but also the associated neck, shoulder, and head pains. These directed forms of treatment resulted in improvement to a significant extent in 25 of the 36 cases or 70%. The 11 cases that showed no appreciable improvement were in the category of early injury with litigation unsettled and often with other health professionals such as chiropractors emphasizing other explanations for the pain and providing alternative treatment modalities. All three of the cases who had surgery performed in the "whiplash" group and four of the five cases in the miscellaneous strain group were improved. The one surgical failure had continuation of the same symptoms as preoperatively. No serious complications were encountered in the eight operated cases. There was improvement in eight of the ten cases seen late (average four years) including three cases who required surgery.

Comments

My experience with T.O.S. complicating whiplash and other forms of cervical trauma remains in many ways similar to ten years ago. There are still those whose arm symptoms are mild and overshadowed by neck and headache complaints, especially in cases seen early in their course, whereas many of those seen late had T.O.S. as the most prominent complaint. Similarly, in regard to treatment, an explanation of the pathophysiologic mechanism of T.O.S. and how it relates to scalene muscle spasm did much to allay the patient's anxiety, fears and frustration. A directed physical therapy approach teaching shoulder girdle toning exercises continues to be useful. A new and important addition to the conservative treatment of cervical strain injured patients with T.O.S. has been the use of biofeedback relaxation training for neck muscle spasm. The use of biofeedback has been successful in our practice for primary muscle contraction (tension) headaches, and when applied to a poorly resolving cervical strain injury in its chronic course (more than six months post-injury), it has resulted in good success in obtaining long-lasting relief in many of those who are motivated. This suggests a learned muscle contraction (tension) syndrome may be common in many cases of chronic, poorly resolved, cervical strain injured patients. In the eight cases of T.O.S. requiring surgery, transaxillary first rib resection was performed in each. The surgical literature of traumatic thoracic outlet syndrome suggests that scalene muscle resection alone may be useful.[8] This more simple operation, however, has not as yet received wide acceptance, and first rib resection remains the standard surgical treatment.

A major contrast in this series of T.O.S. complicating cervical strain injuries with my series of ten years ago is the current lack of reliance on electrodiagnostic techniques. Ten years ago our laboratory relied on the ulnar nerve motor conduction velocity (UNCV) testing through the thoracic outlet as a diagnostic test for T.O.S. The stimulus intensity over the brachial plexus in the supraclavicular area was necessarily high to evoke a maximum amplitude evoked potential in the abductor digiti quinti muscle of the hand and was poorly tolerated by patients. This technique has become controversial for other reasons as well. It may result in an unacceptably high "false negative" rate for T.O.S. in typical clinical cases. For example, it was positive in only one of four cases where it was used in the current series. There are additional criticisms that the stimulus point may at times be too distal to the compression point, and measurements of nerve length are a common source of error when using this technique. For these reasons, this test is now seldom used in our laboratory.

F-wave latencies of the ulnar nerve are performed by stimulating the ulnar nerve at the wrist causing an impulse to spread antidromically up the motor axons to the spinal cord and then backing the same axons to the ulnar innervated hand muscle. Despite some early enthusiasm for this test in confirming T.O.S., it has proved much too insensitive to be relied upon. Sensory evoked potentials recorded from the brachial plexus and cervical spine have also been used to con firm T.O.S. but the early reports have not been sufficiently confirmed to recom mend it as a standard procedure.[9] It is quite likely that because of the intermittent nature of the symptoms of traumatic T.O.S. and the lack of neurologic deficits, electrodiagnostic techniques will continue to be "positive" in only a small percentage of the patient population. Vascular studies are necessary only in the exceptional cases where vascular symptoms are subjectively and objectively prominent. Vascular symptoms were rare in this group of traumatic T.O.S.

Currently, the diagnosis for T.O.S. is made on the basis of characteristic symptoms in the clinical history with reproduction of these symptoms by clinical shoulder girdle stress maneuvers. Other helpful clinical findings seen in the majority of the cases include tenderness of the brachial plexus in the supraclavicular fossa and the reproduction of T.O.S. symptoms with pressure applied to the plexus in this area.

The wider recognition of T.O.S. as a complication of whiplash and other cervical strain injuries is needed, not only for optimum treatment, but also to properly assess long-lasting or permanent deficits for use in settling personal injury and workman's compensation claims. Ronald E. Gots, M.D. in *"The Independent Adjuster"*, a tradepaper for insurance company claim adjusters, commented on a case example of a thoracic outlet syndrome complicating a whiplash injury by saying, "trauma very simply cannot produce this condition unless there is massive injury to the chest or front of the neck." In discussing a case report, he thereby dismissed a "year-old whiplash injury" as being in no way cause for the thoracic outlet. This attitude does a disservice to the patient with a cervical strain injury because there is now ample evidence establishing T.O.S. as a complication. The follow-up of the present series of cases is short, but in similarly diagnosed and treated cases of T.O.S. over the past 14 years, I have concluded that if symptoms are present two years post-accident and if directed conservative treatment given over a period of at least six months failed, one can reasonably assume the condition will be permanent.

Among many physicians, including many of my colleagues in neurology and neurosurgery, the concept of T.O.S. is often restricted to that rare group of patients which the British have defined as "cervical rib and band." This is secondary either to a cervical rib or long transverse process (C7) with fibrous attachment to the first rib, which often results in intrinsic muscle wasting in the hand. The presence of objective weakness, atrophy and denervation on EMG is usually present in this group. This entity was seen in only two cases in my practice over the last two years, compared to the 58 cases in the current series of a more broadly defined T.O.S.

Summary

Thoracic outlet syndrome is a common complication among patients with cervical strain injury referred to a general neurologic practice. Thirty-six percent of the cases seen with cervical strains in the current series of 111 patients developed this complication. Correct diagnosis will allow for improved treatment of these patient and will serve to avoid unnecessary diagnostic procedures and ineffective and sometimes dangerous surgery such as cervical fusion. Thoracic outlet syndrome will continue to suffer under-diagnosis or mis-diagnosis unless there is a broader acceptance of the current clinical criteria for establishing the diagnosis. At the present time there remains no universally accepted laboratory test, either electrodiagnostic or vascular, to confirm the diagnosis in the majority of cases.

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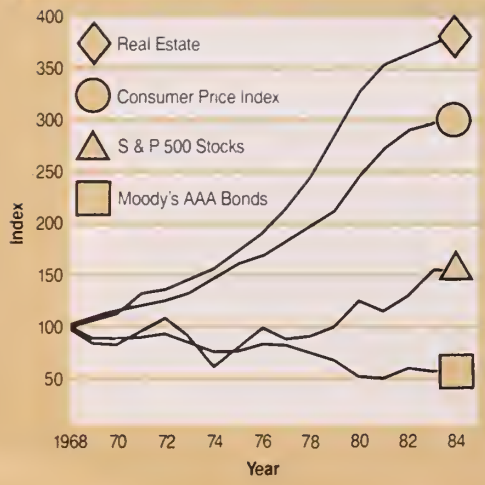

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Endometriosis of the Appendix and Cecum
Associated with Acute Appendicitis

CHRISTOPHER W. THIEL, M.D.*

Endometriosis of the appendix and cecum is not a rare occurrence; however, the association of acute appendicitis with endometriosis in these locations is a much less common finding. The following communication describes a case of endometriosis of the appendix and cecum apparently causally associated with acute appendicitis.

Endometriosis has been reported to involve the appendix in 1.4% of cases with external endometriosis.[1] Ileal and cecal involvement has also been noted not to be rare.[2] Endometriosis of the appendix, however, is rarely accompanied by symptoms of appendicitis and frequently is an incidental finding at surgery.[3] The following report describes a case of endometriosis of the appendix and cecum found in association with acute appendicitis apparently in a causal fashion.

A 41-year-old nulligravida was found to have two nontender, asymptomatic pelvic masses at the time of a routine clinic visit for removal of her intrauterine device. She had been well without symptoms and had not been sexually active for over one year. Complete blood count at her initial visit was normal with a white blood cell count of 6,100. Ultrasound revealed a slightly enlarged, irregular uterus with a one centimeter by two centimeter right periuterine mass and a 3.4 centimeter by 5.7 centimeter left adnexal mass. The patient was scheduled for a diagnostic laparoscopy, probable laparotomy.

A short time prior to her scheduled surgery, the patient was again seen in our clinic for a two-day history of fever, headache, and abdominal and back pain with one episode of vomiting two days earlier. On exam she appeared to be in no acute distress. Her temperature was 99.2 and blood pressure was 114/78. There was right costovertebral angle tenderness. Abdomen showed mild tenderness to palpation without peritoneal signs. Pelvic exam confirmed previous findings. There was no cervical tenderness to motion, and mild tenderness was noted in the adnexa. Urinalysis showed 10-20 white blood cells and 1-6 red blood cells per high powered field with occasional bacteria. Complete blood count revealed a white blood count to 11,800 with a left shift. She was treated for a presumptive diagnosis of urinary tract infection with Bactrim-DS and her symptoms greatly improved.

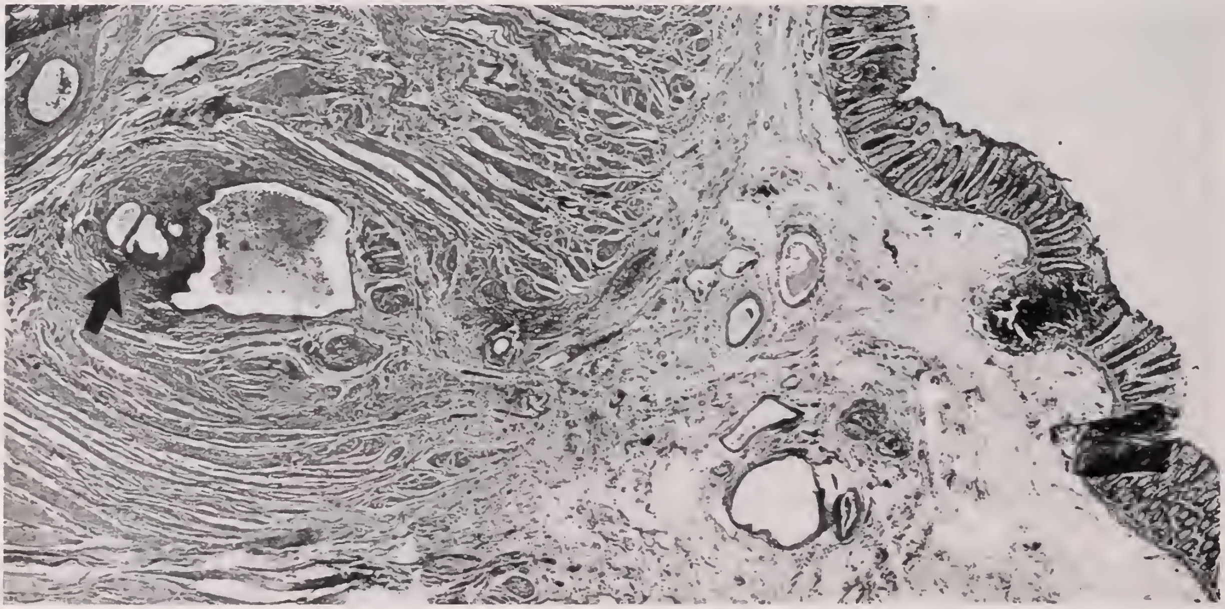

Fig. 1 - Cecum in the area adjacent to the appendiceal orifice. Multiple foci of endometrial glands are present throughout the field (arrow demonstrates good example).

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The patient underwent surgery a few days later as scheduled. Laparoscopy revealed a large mass involving the omentum and cecum adherent to the right lower abdominal wall peritoneum, a 4 centimeter left ovarian cyst and a small powder burn of endometriosis on the left broad ligament. Laparotomy was performed, and the left ovarian cyst was drained of chocolate material and appeared to be an endometrioma. In the course of exploring the large pelvic mass, it was found to include an inflamed appendix draining a large amount of pus. Consultation from general surgery was obtained and further exploration revealed a two centimeter by three centimeter hard cecal mass with transmural involvement of the bowel. Enlarged ileocecal mesenteric nodes were also noted. Because of the extent of the bowel involvement by the process and because malignancy could not be excluded, a partial right hemicolectomy with end to end ileocecal reanastomosis was performed. The patient preoperatively had expressly instructed that the minimal amount of extirpative pelvic surgery be done, so repair of the left ovary and a uterine suspension were the only additional procedures done. Postoperatively, the patient was covered by intensive antibiotic therapy. Her recovery was uncomplicated, and she was discharged home on the seventh postoperative day.

Surgical Pathology

Gross pathological examination revealed a hard, grayish-white mass in the cecal wall between the appendix and ileocecal valve. Microscopically, multiple deposits of endometriosis were noted throughout the wall of the appendix and the adjacent cecum (Figures 1 and 2). There was erosion of the appendiceal mucosa and suppurative inflammation in the submucosa consistent with acute appendicitis. The mesenteric lymph nodes were found to be hyperplastic but benign, and no evidence of malignancy was noted in any of the surgical specimens. The pathologist observed that acute appendicitis appeared to have resulted from blockage of the appendiceal orifice by endometriosis in the adjacent cecal wall.

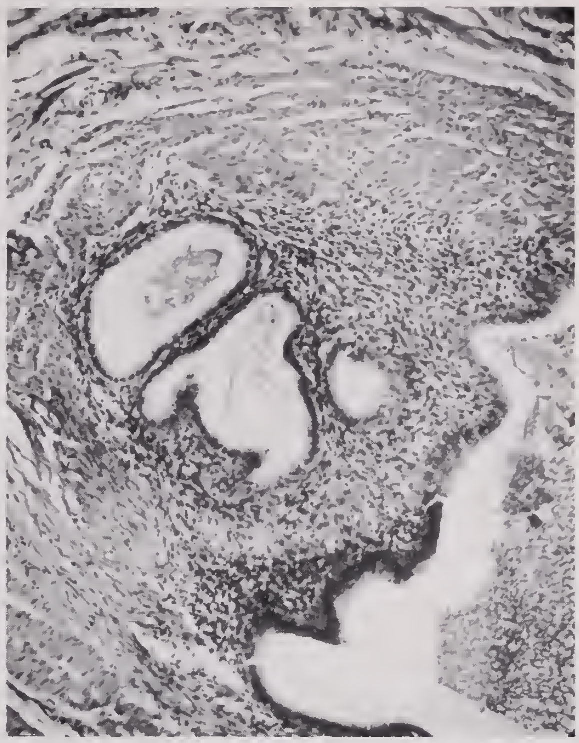

Fig. 2 - Magnification of the endometrial glands at arrow in Figure 1. Surrounding stroma is also clearly evident.

Conclusion

In retrospect, this patient's febrile illness preceding her surgery very likely represented incipient acute appendicitis. Furthermore, the pathological findings of endometriotic involvement of the cecum around the appendiceal orifice suggest that her appendicitis resulted from physical obstruction of the appendix by the endometriosis.

Acknowledgment

Thanks to Donald Gleason, M.D., Department of Pathology, Fairview Hospital Downtown, Minneapolis, and Doris Brooker, M.D., Department of Obstetrics and Gynecology and Pathology, University of Minnesota School of Medicine, for their assistance in preparation of the histological prints.

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Malignant Mesothelioma as a Cause of Death in Minnesota

A Medical-Epidemiologic Dilemma

DAVID E. LILIENFELD, M.D., M.S. ENGINEER* and
PAUL D. GUNDERSON, Ph.D.†

During a recent investigation of asbestos-related disease mortality in Minnesota, the Minnesota Department of Health noted an irregularity in the stated cause of death for cases of intrathoracic malignant mesothelioma. The causes of this irregularity are examined, and a means of correction suggested. Discussions with national experts suggest that although the irregularity was first noted in Minnesota, it is national in scope. The importance of malignant mesothelioma as a cause of death is also reviewed.

The etiological relationship between asbestos exposure and malignant mesothelioma has been known for over two decades.[1] The association is very specific; it was quickly accepted as causal by both the epidemiologic and the medical communities soon after the initial reports. One important aspect of malignant mesothelioma incidence in a population is that it serves as an indication of past asbestos exposure.[2] Currently, an occurrence of such a disease is known as a "sentinel health event"; for a neoplasm, it is a "sentinel neoplasm."[3] Clearly, malignant mesotheliomas can occur in those occupationally exposed to asbestos.[1] Presumably, they will also occur amongst those environmentally (non-occupationally) exposed to asbestos.[2,4] Hence, a sentinel neoplasm can serve as an index for public health officials to areas in which a population may have had an environmental or occupational exposure to asbestos.

As part of its investigation of reported abnormal x-ray findings on the Iron Range, the Minnesota Department of Health ("MDH") conducted an analysis of mortality trends in various regions of the State. One disease of particular interest was a sentinel neoplasm, malignant mesothelioma. The analysis focused on two questions: of what quality are the data (particularly for malignant mesothelioma) and what trends do the data (consisting of stated cause of death on the certificates) suggest are occurring. The former question is the topic of this comment.

Cause of Death Reporting

The existing vital statistics registration system in Minnesota serves two principal functions: verification of death (for legal matters) and as a surveillance mechanism for health officials. Ideally, trends in mortality from various causes of death approximate trends in incidence for those same diseases.[5] The ability of public health officials to discern such

TABLE 1

Major Groups of Diseases Used in the International Classification of Diseases, 9th Revision (ICD-9)

Disease Group	ICD-9 Code
Infectious and Parasitic Diseases	1.0-139.9
Neoplasms	140.0-239.9
Endocrine, Nutritional and Metabolic Diseases	240.0-279.9
Diseases of Blood and Blood-Forming	280.0-289.9
Mental Disorders	290.0-319.9
Diseases of the Nervous System and Sense Organs	320.0-389.9
Diseases of the Circulatory System	390.0-459.9
Diseases of the Respiratory System	460.0-519.9
Diseases of the Digestive System	520.0-579.9
Diseases of the Genitourinary System	580.0-629.9
Complications of Pregnancy, Childbirth and the Puerperium	630.0-676.9
Diseases of the Skin and Subcutaneous Tissue	680.0-709.9
Diseases of the Musculoskeletal System	710.0-739.9
Congenital Anomalies	740.0-759.9
Certain Conditions Originating in the Perinatal Period	760.0-779.9
Symptoms, Signs and Ill-Defined Conditions	780.0-799.9
Injury and Poisoning	800.0-999.9

Source: World Health Organization[6]

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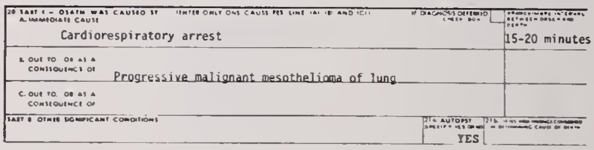
trends is dependent upon the accuracy of the stated cause of death on the death certificate. If such statements are lacking in precision, then the trends in mortality based upon those statements will be inaccurate. One such indicator is the affirmative indication that an autopsy was performed.[5]

When an individual dies, the attending physician completes a death certificate, which is filed with the Minnesota Department of Health. The cause of death is then coded according to a National Center for Health Statistics protocol into a 4-digit rubric specified in the *International Classification of Diseases, 9th Revision* (ICD-9).[6] The categories in ICD-9 are hierarchical, by type of disease and by anatomical site within that category (Tables 1 and 2).[6] For example, neoplasms are represented by ICD-9 codes 140.0 through 239.9. For malignant neoplasms within the respiratory system, or intrathoracic organs, the corresponding codes are 160.0 through 165.9. More specifically, lung carcinoma is coded 162.0 through 162.9 and malignant mesothelioma of the pleura, 163.0 through 163.9. Tabulations of mortality attributed to a given cause of death for Minnesota residents can be easily obtained by reference to the appropriate ICD-9 code. A recent investigation by the MDH, however, has disclosed a dilemma with the manner in which a specific cause of death has been stated on the death certificate.

Statements of the Cause of Death on the Death Certificate

The particular dilemma in the cause of death statement occurs with regard to intrathoracic malignant mesothelioma. Since malignant mesothelioma is a sentinel neoplasm for prior asbestos exposure, an increase in mortality from it among the Iron Range residents might indicate previous asbestos exposure. No known association exists between cigarette smoking and malignant melanoma. During the investigation of these mortality trends, a question arose concerning the manner in which malignant mesothelioma was stated as the cause of death on the certificate. Some physicians have described the cause of death as "malignant mesothelioma of the lung" (Figure 1). The exact location, as far as they were aware, was in the lung. The nosologist at the MDH would interpret such a statement as meaning a malignant (mesothelioma being a specific malignant histology, similar to squamous cell or adenocarcinoma) neoplasm of the lung. Hence, the ICD-9 code assigned to cause of death for this case would be 162.9. Since malignant mesothelioma of the pleura is 163.0 through 163.9, this case would *not* be included in any tabulations of malignant mesothelioma mortality, which conventionally use ICD-9 codes 163.0 through 163.9. However, if the cause of death were stated as a "malignant mesothelioma of the pleura," then the case would be coded as 163.9 and included in any such tabulations (Figure 2). The physician is thusly in a dilemma as to how to best describe the location of the intrathoracic malignant mesothelioma.



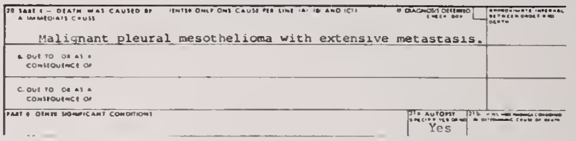
Cardiorespiratory arrest

15-20 minutes

Progressive malignant mesothelioma of lung

AUTOPSY YES

Fig. 1 - Example of the cause of death for a case of "malignant mesothelioma of lung," which would be coded as ICD-9 rubric 162.9.



Malignant pleural mesothelioma with extensive metastasis.

AUTOPSY Yes

Fig. 2 - Example of the cause of death statement for a case of "malignant pleural mesothelioma," which would be coded as ICD-9 rubric 163.9.

The authors believe that Minnesota's public health officials would be greatly aided in such future investigations if physicians would record the cause of death for cases of intrathoracic malignant

TABLE 2

Tabular Listing of Specific ICD-9 Codes Corresponding to Anatomic Sites of Malignant Neoplasms in the Respiratory System and Intrathoracic Organs

(Codes 160.0-165.9)

Site of Malignant Neoplasm	Code
Nasal Cavities, Middle Ear, and Accessory Sinuses	160.0-160.9
Larynx	161.0-161.9
Trachea, Bronchus, and Lung	162.0-162.9
Pleura	163.0-163.9
Thymus, Heart, and Mediastinum	164.0-164.9
Other and Ill-Defined Sites within the Respiratory System and Intrathorcic Organs	165.0-165.9

Source: World Health Organization[6]

mesothelioma in which it was the cause of death as "malignant mesothelioma of the pleura." Similarly, for cases in which an intrathoracic malignant mesothelioma was a contributing cause or a co-existing condition, the condition should be described as a "malignant mesothelioma of the pleura."

Conclusion

Physicians in Minnesota have a long and outstanding record of cooperation with the State's public health officials. Recent specification of the cause of death for some cases of intrathoracic malignant mesotheliomas has resulted in coding errors in the vital records system for Minnesota. This paper has explored the attending physician's dilemma in stating the cause of death precisely so that the integrity of the Minnesota vital statistics system can be maintained and remain the model to the nation that it currently is. This is an ongoing process to which the Minnesota medical community has been a major contributor.

Acknowledgment

The authors wish to thank Mr. Fred King and Ms. Judy Hammerstrom for their assistance in the preparation of this manuscript.

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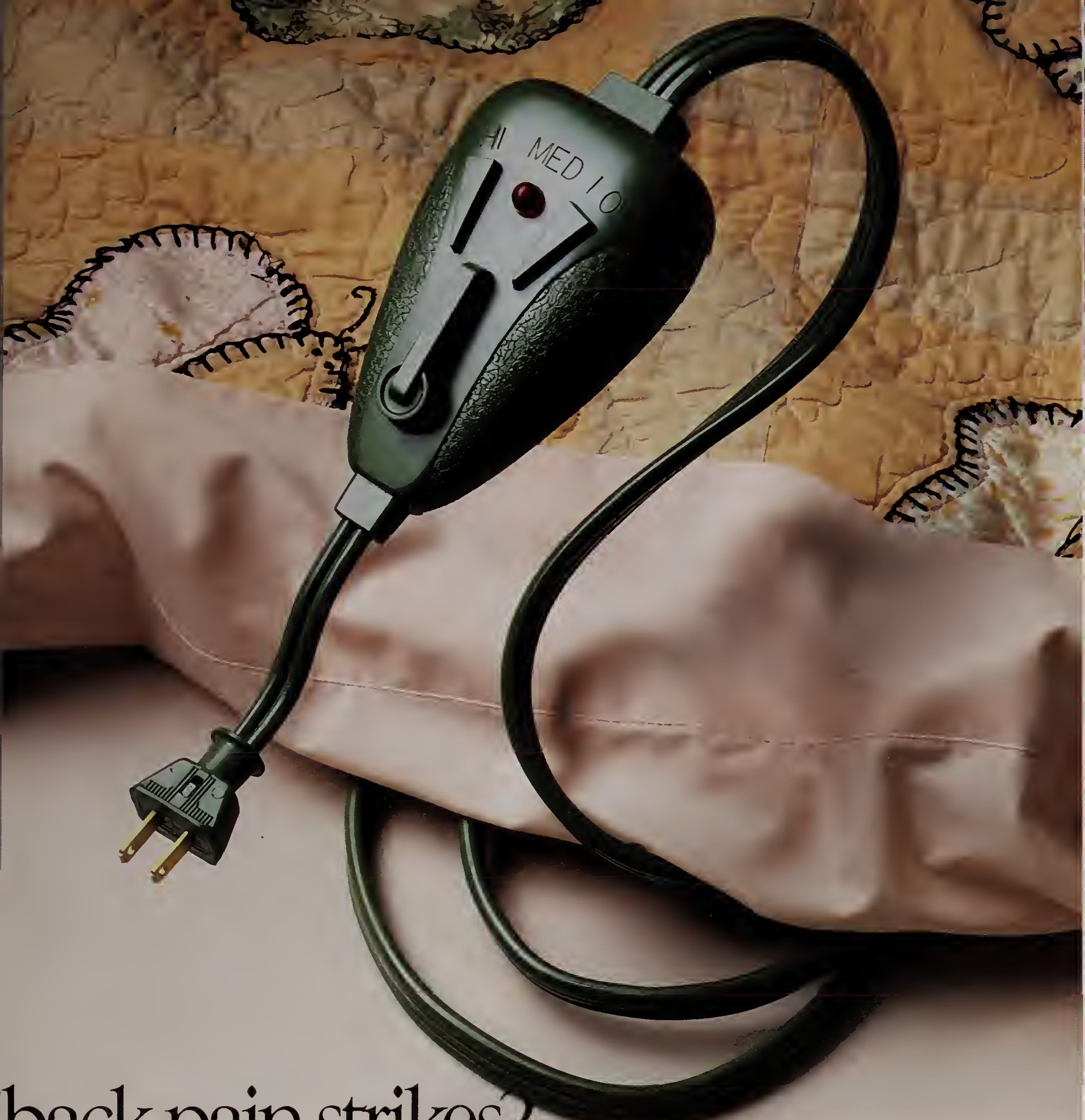

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Acquired Immunodeficiency Syndrome

A Contemporary Overview

KENT CROSSLEY, M.D. AND
MMA TASK FORCE ON AIDS*

This is the first of a series of articles about the acquired immunodeficiency syndrome (AIDS) prepared by the Minnesota Medical Association Task Force on AIDS. Subsequent contributions will deal with timely, clinically relevant issues related to this disease. The next issue of *Minnesota Medicine*, for example, will provide detailed information about serological testing for HTLV-III antibody and its use in the evaluation of patients at risk for AIDS.

A large amount of information has been published about the acquired immunodeficiency syndrome. Most of the studies reported in the medical literature have dealt with clinical or epidemiological aspects of the disease. The lay press has tended to focus on projections of the number of cases of AIDS and on methods and probabilities of transmission. Very little information is available to assist the practicing physician with practical clinical questions which relate to this disease. The task force believes that it is most important for physicians to be aware of when to consider the diagnosis of AIDS and how to make a diagnosis of AIDS and AIDS-related complex (ARC). The actual evaluation and management of a patient with AIDS is both medically and psychosocially complex. The MMA can refer Minnesota physicians to clinicians with experience in caring for AIDS patients who can offer advice about management or accept referrals of individuals with this disease.

AIDS may be simply defined as the occurrence of an unusual opportunistic infection in a patient who is not obviously immunocompromised.[1] AIDS-related complex (ARC) has not been as clearly defined. One definition is summarized in the Table. Other investigators use this term to refer to patients who have not had an opportunistic infection but who manifest one or more of the clinical findings (lymphadenopathy, weight loss, chronic diarrhea, etc.) seen in AIDS patients and who also have serologic evidence for infection with the virus thought to cause AIDS.

The unusual RNA-containing virus responsible for AIDS (referred to as the human T-lymphotropic virus or lymphadenopathy-associated virus or HTLV-III/LAV) selectively acts on T-lymphocytes. In this process, dramatic alterations occur in a patient's immune status which allows the occurrence of unusual infections. It has become clear the virus is also probably causally associated with the occurrence of Kaposi's sarcoma and with certain B-cell lymphomas. In recent months, substantial evidence has gathered to indicate that the virus has effects on tissues other than the immune system. Infection with HTLV-III is causally associated with dementia, spinal cord degeneration, peripheral neuropathy, and chronic meningitis in patients who have been diagnosed as having AIDS.[3] Although less well documented, there is evidence that the virus also may infect other organ systems and cause other clinical findings (e.g. chronic diarrhea).

Presence of antibodies to the HTLV-III virus is thought to be a reliable indicator of infection. A positive HTLV-III antibody is not, however, diagnostic of AIDS. Present knowledge suggests that of HTLV-III antibody positive individuals, about 5-10% have AIDS, 15-20% have ARC and the remainder are asymptomatic.

TABLE

AIDS-Related Complex (ARC)*

Any Two Clinical Features	*Plus*	*Any Two Laboratory Abnormalities*
Fever >100°F ≥ 3 months		Helper T cells <400/mm30
Weight loss >10% or ≥ 15 pounds		Helper: suppressor ratio <1.0
Lymphadenopathy ≥3 months		Leuko-thrombocytopenia, anemia
Diarrhea		Elevated serum globulins
Fatigue		Depressed blastogenesis (phytohemagglutinin)
Night sweats		Anergy to skin tests

*After Devita, et al.[2]

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*Members include: Mike Daly, M.D., Minneapolis; Mark Eckman, M.D., Duluth; Robert Gruninger, M.D., (Co-Chairman), Minneapolis; Hanan Rosenstein, M.D., Minneapolis; Margaret Simpson, M.D., Minneapolis; Scott Strickland, M.D., Minneapolis; David Williams, M.D., Minneapolis, and Kent Crossley, M.D., St. Paul (Chairman). Valentine O'Malley, M.D. and Michael Osterholm, Ph.D., M.P.H. are ex-officio members.

Clinical manifestations in patients with AIDS vary widely. Most patients who have been seen in Minnesota have presented initially with an unusual infection. The most common have been Pneumocystis carinii pneumonia, Candida esophagitis, and disseminated Mycobacterium avium-intracellulare infection. Cytomegalovirus infection (particularly with retinitis) and herpes virus infections have also been frequent.

While Pneumocystis carinii pneumonia is usually associated with patchy pulmonary infiltrates and hypoxia, a number of patients with AIDS have presented with breathlessness, hypoxia and normal chest Xrays. Candida esophagitis is often associated with Candida stomatitis, and the diagnosis is usually easy to make in the presence of characteristic intraoral lesions and dysphagia. M. avium-intracellulare infection is not obvious; clinical findings tend to be prin cipally limited to fever. Most patients have widely disseminated infection and positive blood, bone marrow and stool cultures. Serious cytomegalovirus infection is usually first evident by the occurrence of retinitis. Herpes simplex infection commonly is associated with extremely indolent perineal lesions although this virus and herpes zoster may both cause disseminated infection in AIDS patients.

A variety of other unusual infections may occur in patients with AIDS. Commonly seen examples include chronic diarrhea caused by an uncommon parasite (Cryptosporidium) and cryptococcal meningitis.

The acquired immunodeficiency syndrome largely occurs in male homosexuals and in intravenous drug abusers. Approximately 90% of the 15,000 cases now known in the United States have occurred in these populations. A small proportion (1-2%) of cases have occurred in patients with hemophilia and in heterosexuals who have had sexual contact with individuals with AIDS. About 1% of cases have occurred in children born to women with this illness.

Serious consideration of a diagnosis of acquired immunodeficiency syndrome is most appropriate in (1) homosexual or bisexual men who have had sexual contact with other men, (2) persons known to use unprescribed drugs by parenteral routes, (3) individuals who have received large volumes of transfusions of blood or clotting factors and (4) sexual partners of any individuals at risk for the disease. Approximately 50% of children born to mothers with the acquired immunodeficiency syndrome will meet the criteria for this illness in the first year of life.

Although the diagnosis of AIDS is a clinical one, it is increasingly becoming clear that the original definition (designed for surveillance purposes)[1] has become less and less useful in clinical medicine. It is perhaps a good general rule that any homosexual male with unusual symptoms and findings or with evidence of infection which seems peculiar or unusually prolonged should be evaluated with this diagnosis in mind. While testing for HTLV-III antibodies may be clinically useful in some situations, there is concern that a positive test may be associated with problems for future insurability. Use of serologic testing in clinical medicine will be discussed in detail in next month's *Minnesota Medicine*.

Several excellent publications about AIDS have recently appeared. The most useful single recent composite of information is the November 1985 *Annals of Internal Medicine* which contains the proceedings of a conference on AIDS held in Atlanta in April, 1985. Included are detailed descriptions of the nature of the virus and the clinical and psychosocial aspects of this disease. There is also one excellent text available.[2]

The Minnesota Medical Association maintains a listing of physicians who are willing to respond to telephone inquiries about AIDS or who welcome referrals of patients who have AIDS or other HTLV-III associated disease. By calling the Minnesota Medical Association offices (612) 378-1875 or (800) 843-6562, ext. 215 and asking for Eugenia Kassar or Josie Siegrist, it is possible to be referred to one of these physicians.

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Magnetic Resonance Imaging

Basic Principles

HARRY CRAMER, JR., M.D.* and ROBERT J. RUST, M.D.*

In recent years, cross-sectional imaging techniques, such as ultrasound and x-ray computed tomography, have achieved wide acceptance in medical practice. However, just as these techniques have become widely available, a new imaging method has been developed, based on entirely different physical principles, and promising new insights into both normal and disordered metabolic phenomena. The new technique has acquired several names, including nuclear magnetic resonance, magnetic resonance imaging, and zeugmatography. The names have been reduced to the initials NMR or MRI, and opinions vary about which name or set of initials is appropriate. The purpose of this discussion is not to resolve that question, however, but to describe the basic physics of this new imaging technique and some of its potential applications.

Bloch, at Stanford, and Purcell, at Harvard, independently discovered the phenomenon of nuclear magnetic resonance in 1946, and both were awarded the Nobel Prize in 1952 for their discovery. The observations upon which these physicists' work was based include the fact that some atoms (basically those with an uneven number of protons and/or neutrons in their nucleus) have a net magnetic field. This field occurs because protons and neutrons, the particles which comprise atomic nuclei, are spinning charged particles. Neutrons are electrically neutral, but are comprised of charged elements that are not uniformly distributed; therefore, neutrons have a small magnetic field despite their electrical neutrality. These spinning charges generate magnetic fields that behave like bar magnets, i.e., having both north and south poles. These atomic magnetic fields will interact with externally applied magnetic fields, becoming aligned with the external fields. When the atomic magnetic fields are aligned with the externally applied strong magnetic fields, it becomes possible to induce resonance between the atomic magnetic fields and externally applied radio waves. The radio waves must be of the appropriate frequency to induce resonance. When resonance occurs, there is a net addition of energy to the atoms' magnetic fields. The atoms' magnetic fields, having absorbed the radio wave energy, are in a higher energy state than they were before resonating with the applied radio waves. When the atoms' magnetic fields return to their ground states, they release quanta of radio waves. The released radio waves are of the same frequency as those the atoms originally absorbed, a frequency that is dependent on the strength of the applied external magnetic field. The strength of the signal is proportional to the number of resonating atoms. Furthermore, the radio signal that is released varies with time. The variation with time can be characterized by two time constants—T_1 and T_2. T_1, called the longitudinal relaxation time, is an exponential term that describes how long it takes for the atomic magnetic fields to return to ground state after they have absorbed enough radio wave energy to have inverted their magnetic field orientation from that of the externally applied magnetic field. T_2, called the horizontal relaxation time, is a second exponential term that is a measure of how much interaction occurs between the magnetic fields of adjacent atoms. Since each atom contributes to the local magnetic field strength and direction, it can affect, and be affected by, its neighboring atoms' magnetic fields in such a way that the radio signal released following magnetic resonance varies in strength and in frequency from the resonating radio waves. T_2 varies with the molecular environment of the atoms in question.

Finally, a technique called chemical shift imaging can be employed to characterize the chemical environment of small volumes. For example, pH changes can alter the configuration of proteins, in turn altering the signals obtained from atoms within the proteins. For the human body, hydrogen is the most common element that possesses a magnetic field and therefore can be used for magnetic resonance studies. However, chemical shift imaging is commonly carried out with other elements, notably phosphorus.

In 1971, Lauterbur and others determined that, because the resonant radio wave frequency is proportional to the strength of the externally applied magnetic fields, variations of the applied magnetic field over space could be employed to produce spatially encoded information. A three-dimensional map of data can thus be obtained that can be used to create images in any plane, utilizing the techniques that previously have been developed for computed x-ray tomography. Recognizing that the magnetic resonance imaging signal can be characterized by intensity, T_1, and T_2, images can thus be created that characterize tissue by concentration of the element in question (usually hydrogen), by T_1 value, by T_2 value, or by combinations of the above.

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Currently, x-ray computed tomography produces well detailed images with very good density resolution. Why do we need images based on nuclear magnetic resonance? Firstly, x-ray techniques measure only one variable: electron density. If a region of the body contains tissues having more electrons than another region (e.g., bone vs. fat), it absorbs more Xrays, casting a more dense shadow than the less-electron-dense region. Magnetic resonance imaging techniques, however, permit imaging based on four variables: Concentration, T_1, T_2, and chemical shift. Therefore, more information can be obtained, and tissues can be better characterized.

Secondly, x-ray imaging techniques employ ionizing radiation. Although risks with radiographic diagnostic studies are extremely small, they cannot be said to be zero. MRI eliminates ionizing radiation risks entirely.

Thirdly, MRI techniques can be used to assess motion, particularly of fluids such as blood; therefore, flow data can be derived without invading the patient.

Against these benefits, there are several new difficulties encountered with magnetic resonance imaging. These include problems related to magnetic interaction with the strong magnetic field employed for imaging. For example, events and structures at substantial distances (up to 40 feet from the strongest currently planned magnets) can cause distortion of the images; also, the magnet will attract large iron-containing mobile structures like oxygen tanks, wheelchairs, mobile beds, etc., in its vicinity. If these structures and devices are not restrained, they can travel quickly into the magnet, potentially creating patient hazard. Furthermore, computers and conventional x-ray equip ment will not function in strong magnetic fields, and so must be kept at a distance from the magnet. Magnetically encoded information on credit cards is erased by strong magnetic fields, and there can be consequent inconvenience.

Another issue in magnetic resonance imaging is the cost of such studies. It is estimated that a magnetic resonance imaging study may be one and a half to three times the cost of a comparable x-ray computed tomographic examination.

At this point, magnetic resonance imaging is the optimum means to study posterior fossa abnormalities and to characterize diseases of the spinal cord. Its future applications appear to be extensive and, assuming that government decisions are not taken to the contrary, MRI promises to become more widely available, and to offer an additional means to characterize disease. The tasks of the medical community now are to master its intricacies and to determine its appropriate role in medical imaging and patient care.

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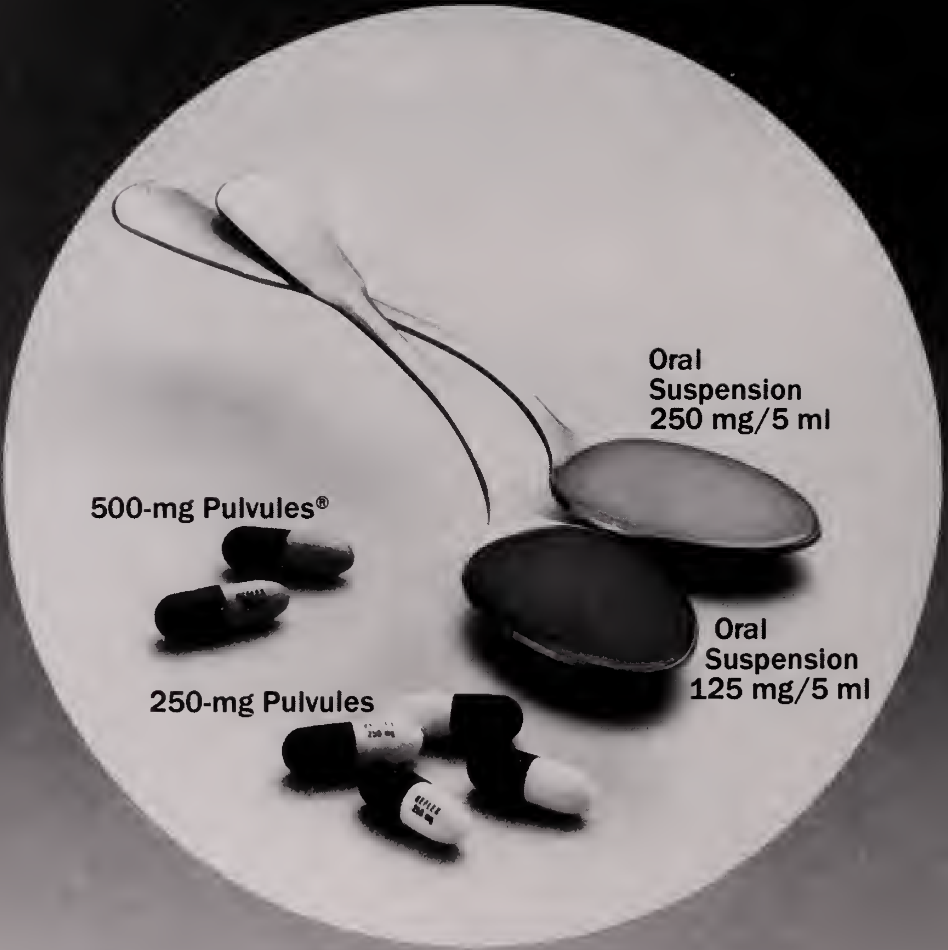
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Comparative Analysis of Pediatric Clerkships

KEVIN TAYLOR, M.D.* +; ROBERT M. LARSON, M.D.*; and LEON SATRAN, M.D.*

Differences among seven pediatric clerkships offered to University of Minnesota medical students were assessed. Seven fourth-year students recorded the types and frequency of patient problems encountered in their six-week pediatric courses during the summer of 1982. The students were in various clinical settings, ranging from exclusively hospital-based inpatient sites to predominantly ambulatory-based locations. Clerkships were compared and analyzed, describing the diverse types of learning sites that are available to medical students. Suggestions are made to increase pediatric ambulatory experience for students by greater utilization of practitioners in the community.

University-based hospitals have traditionally provided most of the clinical education for medical students. During the past two decades, however, an increasing proportion of this education has been transferred from university centers to government and community hospitals affiliated with medical schools.[1] The trend in pediatric education is toward increased use of community outpatient settings such as practitioners' offices and clinics.[2-4] At the University of Minnesota Medical School, third and fourth year students can fulfill their pediatric course requirements by taking hospital-based externships or ambulatory-based preceptorships with pediatricians practicing in the community. Because students can train in such a variety of clinical settings, it is important to understand the experiential differences among these educational sites.

Calhoun, et al. have reported significant differences among various inpatient educational settings (private, university, veterans administration, county) in the time allocated to different clinical activities and the level of student responsibility. However, no correlation has been found between clinical settings and performances of students on the National Board of Medical Examiners Part II subtests.[1,5] To assess more fully the differences among various pediatric clerkships offered to University of Minnesota students, we attempted to describe and analyze seven different student experiences, including the types and frequency of clinical problems that were encountered.

Description of Pediatric Clerkships

All University of Minnesota medical students are required to complete six-week pediatric clerkships during their third or fourth year. Five of the seven students in this study were randomly assigned to train at hospitals. These included Minneapolis Children's Health Center (M.C.H.C.), St. Paul Children's Hospital (S.P.C.H.), University of Minnesota Hospitals (U.M.H.), Hennepin County Medical Center (H.C.M.C.), and St. Paul Ramsey Medical Center (S.P.R.). The other two students specifically requested that their clinical work be at locations that would provide more outpatient experience than the hospitals could offer. One student chose to train at Group Health Plan (G.H.P.), a health maintenance organization in Bloomington, Minnesota. The other selected the St. Louis Park Medical Center (S.L.P.), a mixed fee-for-services and health maintenance organization in St. Louis Park, Minnesota.

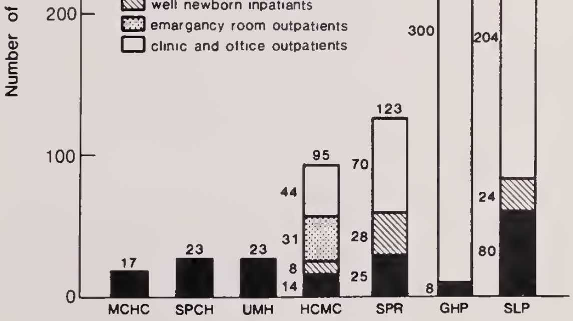

Figure 1 - Total number of patients seen by each student and relative number of inpatients to outpatients at different training sites.

+ Presently, a resident in Internal Medicine at St. Joseph Hospital in Ann Arbor, Michigan.

*Department of Pediatrics, the University of Minnesota School of Medicine, Minneapolis, Minnesota.

Reprint requests to: Leon Satran, M.D., Department of Pediatrics, University of Minnesota, Box 186 Mayo Memorial Hospital, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455.

All seven students took their six-week pediatric courses at the same time, and all had completed one year of experience in various other clinical clerkships. The students recorded the number and types of medical problems encountered during their clinical rotations. Criteria for selecting cases to be recorded were: obtaining pertinent historical data and physical findings, constructing problem lists, arriving at diagnoses, and suggesting plans for management.

The two children's hospitals (M.C.H.C. and S.P.C.H.) and the University Hospital (U.M.H.) provided exclusively inpatient experience for the students. St. Paul Ramsey Medical Center divided the time spent in the clerkship into approximately 60% general inpatient, 25% inpatient newborn, and 15% outpatient experience. The Hennepin County Medical Center clerkship was divided into 45% clinic, 33% emergency room, and 21% inpatient experience including well newborn care. The Group Health clerkship consisted of 97% outpatient and 3% inpatient work. The St. Louis Park group offered 70% outpatient and 30% inpatient experience including well newborn care.

Results

The seven students saw a total of 887 patients during their six weeks of pediatric training. Figure 1 shows the total number of patients seen by each student and relative number of inpatients, including well newborns, to outpatients among the different training sites. Patients were grouped into 19 broad problem categories according to the classification in Nelson's *Textbook of Pediatrics*.[6] Table 1 shows the number of problems seen in each category in the respective clinical setting.

The Minneapolis Children's Health Center (M.C.H.C.) provided the lowest number of assigned patients (17) (Figure 1), and the lowest number of problem categories (8) (Table). However, all of these were hospitalized patients, many for diagnostic evaluation and management of complicated illnesses such as repeated apneic spells, severe joint pain, and symptomatic congenital heart disease. It was felt that the severity and complexity of problems encountered by the student at this site compensated for the relatively low total number of patients. At St. Paul Children's Hospital (S.P.C.H.) a total of 23 inpatients were assigned (Figure 1). Despite this

TABLE

Problem Categories and Numbers of Patients Seen by Students

Problem Categories	MCHC	SPCH	UMH	HCMC	SPR	GH	SLP
Preventive Pediatrics				32	48	35	176
Neonatal Care (Inpatient)			6**	6*	28*		24*
Prenatal Disturbances	4	1	5		2	3	7
Immune/Allergy/Asthma	1	1		5	6	20	11
Infectious Disease	2	6	4	24	6	168	48
Digestive	3	1		2		2	1
Respiratory			1				1
Cardiovascular		1					
Diseases of Blood/Lymph		1	2			1	2
Neoplasms		1	2				6
Urinary System		1	2	1	1	5	1
Metabolic Disorders					7	9	2
Endocrine System	1				15	13	
Nervous System	1	1	1		4	5	
Neuromuscular						4	
Bones, Joints (trauma)	1	7		23	3	29	7
Skin						8	
Ophthalmology				1		3	
Miscellaneous	4	2		1	3	13	2
Total number of patients	17	23	23	95	123	318	288
Total number of Problem Categories	8	11	8	9	11	15	13

MCHC — Minneapolis Children's Health Center
SPCH — St. Paul Children's Hospital
UMH — University of Minnesota Hospitals
HCMC — Hennepin County Medical Center
SPR — St. Paul Ramsey Medical Center
GH — Group Health Plan
SLP — St. Louis Park Medical Center

*Well newborn inpatients
**Ill newborn inpatients

small number, the student had the opportunity to evaluate children with diseases in eleven different categories (Table). This hospital-based clerkship provided the student with experience in seeing a wide range of illnesses including life threatening malignant disorders such as acute leukemia and neuroblastoma. Similarly, at the University of Minnesota Hospitals (U.M.H.), the student was assigned 23 inpatients (Figure 1), most of whom had complex medical problems that required an extensive amount of student time and effort. This group of patients included six ill newborns.

At Hennepin County Medical Center (H.C.M.C.), a total of 95 patients were seen by the student (Figure 1). At this site there was considerable outpatient experience (75 of 95 patients) (Figure 1), which accounted for the large number of common problems such as preventive pediatrics (well child exams), infectious diseases, and trauma (Table). Thirty-one of these outpatients were seen in the emergency room, an experience unique among the seven clerkships described. H.C.M.C. also provided six well newborn inpatients (Table).

The St. Paul Ramsey Medical Center (S.P.R.) offered the student experience in eleven problem categories, providing a total of 123 patients (Table). Fifty-three of these were inpatients, 28 of whom were well newborns seen during a two-week period on the newborn service. This hospital (S.P.R.) offered the most comprehensive newborn experience of any of the hospital-based programs. At S.P.R. there were a large number of children (15) with endocrine disorders because the attending physician was a pediatric endocrinologist. The outpatient clinics at S.P.R. provided the majority of patients (70) (Figure 1). Of the hospital-based programs, H.C.M.C. and S.P.R. offered the best balance of outpatients and inpatients, with unique experiences in emergency room pediatrics (H.C.M.C.) and well newborn care (S.P.R.). It is important to note that, at the five hospital-based training sites, students were required to be directly involved in the management of patients to whom they were assigned.

The Group Health Plan (G.H.P.) in Bloomington offered the largest total number of patients of any clerkship described (318) and the lowest number of inpatients (8) (Figure 1). At G.H.P., the student was not directly responsible for daily management of inpatients and, therefore, was able to spend considerable time in the outpatient clinic. For this reason, a large number of common infectious diseases, trauma problems, and well children (preventive pediatrics) were seen. As at S.P.R., several children with endocrine problems were encountered at G.H.P. because the preceptor was a pediatric endocrinologist. This outpatient-oriented clerkship provided the largest number of disease categories of the seven clinical sites described (15) (Table).

The St. Louis Park Medical Center provided what was perhaps the most comprehensive experience for the student in a pediatric clerkship. At S.L.P., the student saw a total of 288 patients, 84 of whom were inpatients, including 24 well newborns (Figure). The unique feature of this clerkship was that the student performed admitting evaluations and made rounds on inpatients of twelve practitioners in the St. Louis Park pediatric group. There was opportunity to participate in the daily management of medical problems such as Henoch-Schonlein purpura, rhabdomyosarcoma, septic arthritis, and cystic fibrosis. The schedule at this location allowed for 40% of time to be spent with outpatients, and resulted in the student seeing many preventive pediatric cases and common infectious diseases. This well-rounded clerkship also provided experience with 24 well newborn inpatients, a total comparable to that at S.P.R. (Figure).

Discussion

Scheduled conferences, structured teaching sessions, and interaction with residents occurred more frequently at the University and affiliated hospital training locations (M.C.H.C., S.P.R., H.C.M.C., and S.P.C.H.). In addition, these hospital-based programs offered students considerable experience in managing severely ill patients. Nevertheless, this analysis indicates that important resources for pediatric education exist in community outpatient settings. These resources, which are not as available in University or affiliated hospital settings, include large numbers of ambulatory patients, greater variety of clinical problems, and opportunities to manage common pediatric illnesses.

Diverse educational settings for medical students similar to those described herein have been previously advocated. In discussing essentials of good ambulatory pediatric education, Haggerty suggests that the first direct patient experiences should present uncomplicated problems such as common acute illnesses. Students should learn such simple, but often neglected, techniques as introducing themselves to patients, talking with children, developing general skills in interviewing, and using physical examination methods that are appropriate and effective for different age groups. Students should begin with detachment (observing the physician) and progress to engagement (serving as the responsible physician). Outpatient departments with permanent, enthusiastic, and committed staff have set clear objectives for students and teachers, and who have developed new and exciting places to teach, are responsible for the entire operation, and are themselves fully engaged in the care of patients in these settings.[3]

Anderson states that a private community pediatrician's office is the best place in which to achieve Haggerty's goals for ambulatory education. He asserts that there are many highly motivated and interested pediatricians who remain untapped reservoirs, who could certainly contribute to effective teaching of medical students.[7] Many private physicians have been reluctant to serve as preceptors for students, believing that time spent in teaching would not be cost effective for their practice. However, Lindenmuth, et al. showed that the cost of the presence of third year medical students in an outpatient primary care site can be offset because the number of patients seen can be increased without significantly prolonging physicians' working hours.[8] Furthermore, Berkelhamer, et al. reported that patients are willing to accept the time costs related to teaching third year medical students in an ambulatory pediatric program.[9]

In conclusion, it should be stressed that, although traditional university-based and affiliated hospital-based pediatric clerkships provide resources needed for developing clinical skills, different, but no less essential educational resources are available in community settings. Although practicing physicians often attend and teach at the aforementioned hospitals, evidence has recently been offered to indicate that pediatricians are significantly more effective as teachers and role models when medical students are exposed to them in their own offices and clinics, i.e., "on their own turf."[10] Concerted efforts by medical school curriculum directors are needed to involve interested community pediatricians in education. Pediatric clerkship programs that combine the best of hospital and community settings should be encouraged and developed. Effective use of both university and community resources will help to provide students with a well balanced pediatric education.

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Sixth Annual Medical Ski Conference

"Diagnostic Dilemmas - The Approach and the Answsers" is the course to be held March 2-7, 1986, at the Keystone Lodge, Keystone, Colorado.

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Contact: Marge Adey, University of Nebraska Medical Center, Center for Continuing Education, 42nd and Dewey Avenue, Omaha, Nebraska 68105. Phone: (402) 559-4152.

Echoes of the Past

A Baker's Dozen

JACK D. KEY, M.A., M.S.

The first published report in this country of a retained surgical sponge appeared in 1884 when H.P.C. Wilson reported[1] on his personal experience with one patient. Comments were also made on 29 other appropriate case histories he collected from colleagues.

One of these was recounted as follows:

[Mr. Lawson Tait's description to Wilson of a fatal case in which a sponge had been left behind.]

> In one of my early operations, a by-stander, hearing me ask for a small sponge, tore one in two, so that there were thirteen sponges in use, instead of twelve, and both the nurse and myself were ignorant of the fact. The gentleman who tore the sponge alone knew of his act, and he left the room before the operation was finished. The result was, that we found the thirteenth sponge four days after, and the horror of the circumstance is as vividly in my mind now as if it had happened yesterday.

Wilson's own case appears to be unparalleled in the published history of abdominal surgery. The following is a brief summary from his report.

> A woman, five months advanced in pregnancy, has an ovarian tumor removed from her, has a large piece of sponge left in the abdominal cavity, miscarries eighteen days after the ovariotomy, has the sponge to remain in her body five months and eighteen days before it escapes through the abdominal walls, and yet the woman is now living, and in better health than ever before. I do not report this case as an example for the improvement of women's health.

This is an article worth reading in its entirety!

Librarian, Mayo Clinic, Rochester, Minnesota

Reference

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11th - 12th	Colon & Rectal Diseases in Primary Care
14th - 15th	Annual Ophthalmology: Current Concepts in Refractive Surgery
17th - 20th	Migrant Health Conference
21st - 25th	Workshop on Fine Needle Aspiration Cytology
25th - 26th	Adolescent Health Program: Gay Youth
28th - May 2nd	Family Practice Review: Update 1986

MAY - JULY

May 7th - 9th	WorldMed '86: International Health Care Congress
7th - 9th	44th Annual Course in Allergy and Clinical Immunology
14th - 15th	Human Aging IX: Health Maintenance and Wellness
20th	Symposium on Gynecologic Oncology
21st - 23rd	Current Concepts in Radiation Therapy
June 4th	Options in Cardiovascular Medicine
6th - 7th	15th Annual Workshops on Clinical Hypnosis - Introductory and Advanced
6th - 8th	Surgery for Primary Care *(Presented in Brainerd, MN)*
13th - 14th	Hospital Nutrition Support
18th - 21st	50th Annual Surgery Course: Advances in Trauma and Critical Care Surgery
25th - 27th	Topics and Advances in Pediatrics
July 7th - 9th	Orthopaedic Surgery: Shoulder
24th - 25th	Symposium on Nuclear Medicine

SEPTEMBER - OCTOBER

Sept 8th - 12th	49th Annual Radiology Course: Gastrointestinal & Abdominal Interventional Radiology
*	Annual Trauma and Critical Care Seminar
26th - 27th	Adolescent Medicine Conference: High Risk Youth
Oct 1st - 3rd	Annual Internal Medicine Review
*	Geriatric Medicine
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The Coalition is presently recruiting individuals in communities across the state to serve as "prime movers." As a prime mover, you will choose a hospital in your community and assist that hospital in becoming smoke-free. Prime movers will receive a "Clean Air Health Care" Manual developed by the University of Minnesota and will have the opportunity to attend a one-day training workshop in spring.

For more information, contact: Judy Knapp, Project Coordinator, Minnesota Coalition for a Smoke-Free Society, Suite 400, Health Association Center, 2221 University Avenue Southeast, Minneapolis, Minnesota 55414.

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For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

FEBRUARY, 1986

3-7 **Dermatology Update** Mayo Clinic/Mayo Foundation; Hyatt Orlando, Orlando, Florida. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

5-7 **Telemark Cancer Conference** The Duluth Clinic, Ltd.; Telemark Lodge, Cable, Wisconsin; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

9-13 **Clinical Anesthesia - State of the Art** Mayo Clinic/Mayo Foundation; Iron Horse Resort Retreat, Winter Park, Colorado. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284/2085.

10-14 **Postgraduate Course in Pulmonary Allergy and Infectious Disease**; Mayo Clinic/Mayo Foundation; Buena Vista Palace Hotel, Florida; CONTACT: William L. Nietz, Mayo Clinic, 200 First Street, SW, Rochester, Minnesota 55905 (507) 284-2085.

12 **Congestive Heart Failure** CME, University of Minnesota Radisson University Hotel, Minneapolis. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware St. S.E., Minneapolis, Minnesota 55455. 612/373-8012.

14-15 **Common Problems in Primary Care-Postgraduate Education Course** Park Nicollet Medical Center, Minneapolis. CONTACT: Elaine Anderson, 5000 West 39th Street, Minneapolis, Minnesota 55416. 612/927-3705.

15-22 **Current Concepts in Medicine** St. John's Hospital; Americana Dutch Resort Hotel, Lake Buena Vista, Florida. CONTACT: Diane Truex, 2696 Hazelwood Avenue, Maplewood, Minnesota 55109. 612/779-4535.

16-21 **Laryngectomee Rehabilitation Seminar** Mayo Clinic/Mayo Foundation; Ala Moana Americana, Honolulu, HI. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

20-21 **Current Concepts in Perinatal Medicine** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

20-27 **Euro-American Conference of Anesthesiology: Views for Today and Tomorrow** Academic Hospital Affiliates; Kauai, Hawaii. CONTACT: Roy Cucchiara, M.D., 200 First Street Southwest, Rochester, Minnesota 55905. 507/285-5601.

24-28 **Internal Medicine Meeting - Endocrinology/Nephrology/Hypertension** Mayo Clinic/Mayo Foundation; Hilton Beach and Tennis Club, San Diego, California. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

26-27 **Drug Therapy Symposium VII** Office of CME, University of Minnesota; Radisson Hotel, St. Paul; CONTACT: Office of CME, University of Minnesota, Box 293 Mayo, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

MARCH, 1986

1-8 **Current Concepts in Medicine** St. John's Hospital; Manor Vail, Vail, Colorado. CONTACT: Diane Truex, 2696 Hazelwood Avenue, Maplewood, Minnesota 55109. 612/779-4535.

3-7 **Current Perspectives in Critical Care Medicine** Mayo Clinic/Mayo Foundation; Turtle Bay Hilton Country Club, Oahu, HI. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

5-8 **Fourth Annual Critical Care Conference** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

8-12 **Electrodiagnosis of Neurologic Diseases** Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota 55905. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55901. 507/284-2085.

10-12 **Bone & Soft Tissue Tumors** Mayo Clinic/Mayo Foundation; Del Coronado Hotel, San Diego, CA; CONTACT: William L. Nietz, Mayo Clinic 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

15-22 **Symposium on Health Care for the Elderly**; Minnesota Medical Association; Kauai Hilton, Kauai, HI. CONTACT: Eugenia C. Kassar, MMA, 2221 University Ave. S.E. - Suite 400, Minneapolis, MN 55414. 612/378-1875.

17-19 **Urology Update** Mayo Clinic/Mayo Foundation; Sawgrasss Resort, Ponte Vedra Beach, FL. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

21-22 **Borderline Syndrome in Children** Abbott Northwestern Hospital; Hyatt Regency, Minneapolis. CONTACT: Sarah Ventres, CME Coord., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461

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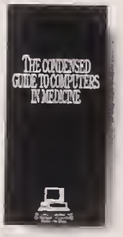

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FAMILY PRACTICE PHYSICIAN

Clinical/Teaching Opportunities

Ramsey Clinic, a university-affiliated, multispecialty facility in St. Paul, has immediate opportunities for two family practice Physicians. Your responsibilities would involve general family medicine including obstetrics along with an ideal opportunity to be involved in academic activities within the Department of Family Medicine, at St. Paul Ramsey Medical Center.

One position exists at our expanded downtown clinic. The other opportunity is in the Ramsey Clinic organization for those interested in practicing within a 50 mile radius of St. Paul.

For immediate consideration, please send your CV in confidence to: *David J. Mersy, M.D., Satellite Medical Director, Ramsey Clinic, 640 Jackson Street, St. Paul, MN 55101.* An equal opportunity employer.

(March continued)

21-22 **Seventh Annual Update:** Occupational Medicine. St. Paul-Ramsey Medical Center; Holiday Inn-Town Square. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

26 **Hypertension Symposium** CME, Medical School, University of Minnesota; 2-690 Moos Tower, University of Minnesota, Minneapolis. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373/8012.

APRIL, 1986

4 **Duluth Heart Conference** The Duluth Clinic, Ltd.; Fitger "Spirit of the North" Theater, Duluth; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

4-5 **Eye Enucleation** CME, Medical School, University of Minnesota; 2-155 Jackson Hall, University of Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota. 55455. 612/373/8012.

5 **Symposium on the Dementias-Pathology** Minnesota Society of Clinical Pathologists; Radisson Metrodome, Minneapolis. CONTACT: Pam Lindberg, MSCP, 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

5 **Minnesota Society of Anesthesiologists Spring Scientific Meeting** Minnesota Society of Anesthesiologists; Marriott, Bloomington, Minnesota. CONTACT: Peter A. Southorn, MBBS, 200 First Street Southwest, Rochester, Minnesota 55905. 507/286-8766.

10-11 **Gynecology Update** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

11-12 **9th Annual Update in Practical Cardiology** Abbott Northwestern Hospital, Abbott Northwestern Hospital. CONTACT: Sarah Ventres, Ed. Dept., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-4300.

11-12 **Colon and Rectal Diseases in Primary Care** CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 **Current Concepts in Refractive Surgery** CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis; CONTACT: Office of CME, University of Minnesota, Box 293 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/373-8012.

17-20 **Migrant Health Conference** CME, Medical School, University of Minnesota; Amfac Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

18 **ENT Update** St. Joseph's Hospital; 69 West Exchange Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

22-26 **Workshop on Fine Needle Aspiration Cytology** CME, Medical School; E.T. Bell Institute, 2-116 Moos Tower, University of Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

24-25 **Pediatric Days** Mayo Clinic/Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayio Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

April 28-May 2 **Practice of Internal Medicine** Mayo Clinic, Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

MAY, 1986

2-3 **Genetics Counseling for the Primary Care Physician** Abbott Northwestern Hospital; Registry Hotel, Bloomington. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

15 **Changing Profiles in Clinical Toxicology.** St. Paul-Ramsey Medical Center, Hennepin County Medical Center, Minneapolis. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

July 31-August 2, 1986 **Third Annual St. Paul-Ramsey Trauma Conference;** St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, WI: CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3980.

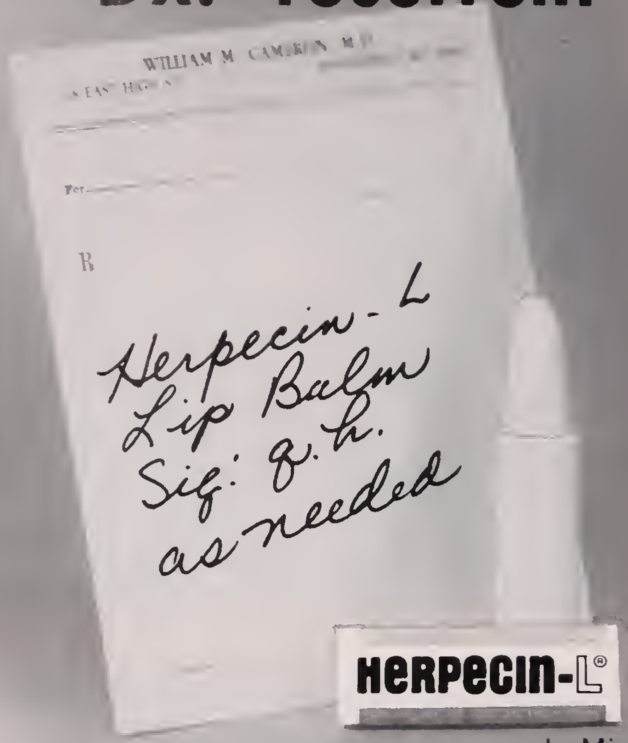
For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

Cover Slides for Minnesota

We are looking for early spring and early summer scenes for covers for Minnesota Medicine. We would like vertical slides which work best for our format, but we will accept horizontal slides.

Bruce Nydahl, M.D.
Cover Editor

Dx: recurrent herpes labialis



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Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

Ophthalmologist, Cardiologist/Internist Specialty positions available with Mankato Clinic, Ltd. Excellent group practice opportunity in All-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R.F. Roskens, Administrator or B.C. McGregor, M.D. (507) 625-1811.

Need Money? Eight family physicians and two primary care specialists needed over next four years, in rural Minnesota. Will consider you now. Educational funds and early sign up bonuses. We are not an agency!! Send name and brief resume to: Minnesota Medicine (765), 2221 University Avenue SE., Suite 400, Minneapolis, MN 55414.

Urologist Wanted Board Certified-Board Eligible Urologist needed to join a well established downtown practice in Minneapolis. Send cirriculum vitae to: Minnesota Medicine (768) 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414.

Family practitioner for Mankato Clinic satellite office. Excellent group practice opportunity in all-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R. F. Roskens, Administrator or B. C. McGregor, M.D. (507) 625-1811.

Internist - East Range Clinics, Ltd. seeks an Internist with special interest in cardiology, pulmonary medicine or intensive care. Opportunity to enter established practice with progressive multispecialty group of 26 physicians including five Internists. Unlimited opportunity for outdoor recreation. Contact Gary Lishinski, Administrator, East Range Clinics, Ltd., 910 North Sixth Avenue, Virginia, MN 55792, (218) 741-0150.

General Surgeon, OB/GYNand Internal Medicine Board Certified or Eligible, to join eight doctor clinic in Cloquet, Minnesota, a community of 12,000 (30,000 service area) located 20 minutes from Duluth-Superior. Clinic facility is located one block from modern, well equipped hospital. Cloquet enjoys a stable economy (forest products). Additionally, our community is noted for its excellent school system. First year salary guaranteed, paid malpractice, health and disability insurance, vacation and study time. Contact John Turonie, Administrator, Raiter Clinic, Ltd., 417 Skyline Boulevard, Cloquet, Minnesota 55720. Telephone (218) 879-1271.

Pediatrics and family practice positions available with our clinic. We offer OB/Gyn, surgical and family practice specialists within our group. Located at the western tip of Lake Superior in northlands of Wisconsin, Superior offers an abundance of recreational activities — skiing, sailing, hunting — excellent education system and cultural activities. Send C/V to: Chairman, Recruitment Committee, 3500 Tower Avenue, Superior, Wisconsin 54880.

Family Physician - Join a progressive medical community in providing medical services to the Sebeka community in central Minnesota. Beautiful area, great community for raising family. Details, contact James G. Lawson, Administrator, Tri-County Hospital, Wadena, MN 56482, (218) 631-3510.

Suburban F.P. Group - SHARE affiliate - seeks associate to service rapid practice growth - competitive salary and benefits - unique opportunity to establish your practice - contact Gloria M. Vierling, Sundance Medical Clinics, LTD., 323 Naumkeag St., P.O. Box 9, Shakopee, MN 55379, (612) 445-6440.

Classified Advertisements

Gastroenterologist or Internist with subspecialty interest in gastroenterology (have all the equipment). Obstetrician/Gynecologist, General Surgeon, Internist, Family Practice in 18 physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact Richard W. Golly, Austin Medical Clinic, P.A., 101 N.W. 14th Street, Austin, MN 55912, (507) 433-7351.

Emergency Medicine - Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132 bed-hospital has an active educational program including ACLS. Contact Richard Golly, Austin Medical Clinic, 101 14th Street, N.W., Austin, Minnesota 55912. (507) 433-7351.

Cardiologist. Excellent opportunity for a Board Certified or eligible Cardiologist to associate with a progressive Cardiology group in North Central Wisconsin. Modern single community hospital offering all varieties of comprehensive Cardiology and Cardiovascular/Thoracic Surgery Services. Position available now. If interested, send CV to and/or contact D. Joe Freeman, M.D., FACC, North Central Heart Clinic, 425 Pine Ridge Blvd., Suite 204, Wausau, Wisconsin 54401. (715) 845-NCHC (6242).

Minnesota, Duluth: Emergency Medicine Physician wanted to fill vacancy in St. Luke's Hospital EMS Regional Trauma Center, with 19,000 annual ED volume. Fee-for-service corporation with negotiable first year salary and then full partnership. Prefer physician ABEM certified or eligible with interest in teaching in local ATLS, ACLS, and FP residency. Send CV to Physicians Emergency Service, Ltd.- 915 E. 1st St., Duluth, Minnesota, 55805. (218) 726-5212.

Psychiatrist to join progressive multi-specialty group of 61 physicians. Pleasant, growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references to ATTN: John P. Merickel, M.D., 101 Willmar Avenue, Willmar, MN 56201.

Family Physician Or General Internist needed for an established primary care clinic of four Family Physicians and a General Surgeon. Guaranteed first year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth which provides excellent referral and continuing education resources. Call collect (218) 834-2171 or write Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, MN 55616.

Canterbury inn bed & breakfast — Rochester's unique alternative to hotel living. Victorian charm with modern comforts. Private baths, fireplace, central air conditioning, gourmet or special diet breakfast anytime, ''teatime'' (wine, hors d'oeuvres, etc.) daily. Private, offstreet parking, 3 blocks to Mayo Clinic and St. Mary's. A very special place for you, your colleagues, and your patients while in Rochester. $50/single, $60/dbl. 723 2nd. St. S.W., Rochester, MN 55902 (507) 289-5553.

Internist Wanted to join a 17 physician multispecialty group in Robbinsdale, Minnesota. Located next to the North Memorial Medical Center. Excellent group practice opportunity, full range of group fringe benefits. Clinic also has two additional satellite offices located in Maple Grove and Osseo. Clinic also is a provider for SHARE HMO, and soon to return as a provider for Physicians Health Plan HMO. Please contact the administrator at North Clinic, P.A., 3210 Lowry Avenue North, Robbinsdale, Minnesota 55422. Telephone 612-588-4625.

OB-Gynecologist Extraordinary opportunity to develop a thriving OB-GYN practice in a small community of 7,000 population located 60 miles west of Minneapolis/St. Paul. Litchfield, with a 10 man physician staff supports an 85 bed acute care hospital. Income negotiable, all options open. Call collect Don Konietzko 612-693-6036 or Chuck Fuller 612-693-2655. Send CV to Don Konietzko Meeker County Hospital, Litchfield, Minnesota 55355.

Family Physician and Internist needed for growing southern Minnesota clinic. Associate, solo or locum tenens position available. Will adjust to accommodate. St. James Area Family Clinic, Box 471, St. James, 56081. (507) 375-3391.

For Sale: Two complete exam rooms, including: exam table, cabinets, wall desk, chair, wall mounted otoscope/ophthalmoscope and BP manometer, doctor's stool - all excellent. Also a call diverter. Inquiries to: Pequot Family Medical Clinic, P.O. Box 407, Pequot Lakes, Minnesota 56472 or (218) 568-4991.

Solo Internist desiring general internist to help in rapidly growing practice. Located on shore of Lake Michigan in Michigan's Upper Peninsula. New 107-bed acute care hospital. Campus for Michigan State College of Human Medicine. Call or write: Dennis Spender, M.D., P.C., 218 South Tenth Street, Escanaba, Michigan 49829. (906) 786-1563.

PROFESSIONAL CORPORATION PENSION and profit sharing plans. Are you getting ready to amend your individually designed pension, profit sharing, 401(k) or cafeteria benefit plan to comply with the new federal laws: TEFRA, REA and DEFRA? Our firm provides legal assistance with plan amendments, design, forms and administration. We quote all fees in advance and for plan amendments, our fee quote covers one year of fees. Contact Roy B. Stromme, attorney, Poindexter Jacobson Stromme & Harwood, 2550 Multifoods Tower, Minneapolis, MN, 55402, (612) 340-0234.

Family Practice Associate desired to join established Family Practice Group in central Indiana community of 50,000. Excellent facilities, comprehensive benefits, highly competative earnings. Must be Board Certified or eligible. Send Curriculum Vitae to: D. Rogers, Business Manager, Kokomo Family Care, Inc. 806 South Berkley Road, Kokomo, Indiana 46901. 317-457-8341.

Medical Office For Rent one, two, or more days a week. Fully equipped. Services of medical assistant available on part-time basis. Suitable for primary care physician, medical subspecialties, general surgeon. Located at the Metropolitan Medical Office Building. For inquiries please call John Orell 332-6278.

Internist would like to share/sublet office with full support on part-time basis. Call sharing possible. Interested in rent/lease based on usage. Prefer South Minneapolis, Southwestern suburbs. Write: Minnesota Medicine (766) 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414.

Family Practitioner needed to join 11 physicians, expanding multi-specialty practice in upper Midwest. Board certified or eligible. Clinic adjoins JCAH hospital. Rural location with abundant outdoor recreational opportunities, small 4-year college. Excellent salary and benefits. Call collect (715) 532-6651 or send curriculum vitae with names of references to: Howard Chatterton, M.D., 906 College Avenue West, Ladysmith, Wisconsin 54848.

Family Physician to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon. Liberal vacation and educational allowances. Competitive salary first year with incentive bonus, and full membership after one year. Blue Earth is a community of 4000 in Southern Minnesota with a drawing of 25,000. 43 bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D.; Blue Earth Medical Center, Ltd.; 520 South Galbraith, Blue Earth, Minnesota 56013. Phone: (507) 526-7371. Personal phone: (507) 526-3177. Marjeane Werner, Clinic Administrator Phone: (507) 526-7371. Personal phone (507) 854-3682.

General Internist would like to assume/purchase practice in Twin Cities Metro Area. Will also consider Group/Partnership arrangement. Write: Minnesota Medicine (767) 2221 University Avenue Southeast, Minneapolis, Minnesota 55414.

Wanted Board Certified Internist to practice in community in Central Minnesota located 60 miles west of Minneapolis/St. Paul. Work with 10 man medical staff in hospital clinic setting. No initial investment. Income negotiable, all options open. Call collect Chuck Fuller 612-693-2655 or Don Konietzko 612-693-6036 or send CV to Don Konietzko, Meeker County Hospital, Litchfield, Minnesota 55355.

Family practitioner needed to join 2 FP's at the Ellsworth, Wisconsin office of a progressive eleven physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact R. M. Hammer, M.D., River Falls, WI 54022. Phone (715) 425-6701 or (612) 436-8809.

Staff Physician -Willmar State Hospital, A JCAH accredited 642-bed hospital serving the mentally retarded, mentally ill, and chemically dependent, has a salaried position for a staff physician. Willmar is a growing city of 20,000 in the Minnesota lake country 90 miles west of Minneapolis/St. Paul. Excellent benefits, stable work environment, competitive salary commensurate with qualifications. Please send indication of interest to Lester E. Johnson, CEO, Willmar State Hospital, Box 1128, Willmar, Minnesota, 56201. Equal opportunity/ affirmative action employer.

Family Practice Physician - Board eligible/certified physician to join supportive primary care staff to provide quality care in a successful and innovative HMO. Located in St. Cloud, Minnesota (approx. 50,000 population, 3 colleges, full recreational activities, 70 miles from Twin Cities). New clinic facility. Full range of fringe benefits (competitive salary, liberal vacation, 2 weeks educational leave, retirement fund, etc.). Full range of FP responsibilities including OB. Contact Dr. Patrick Lalley, Central Minnesota Group Health Plan, 1245 15th Street North, St. Cloud, Minnesota 56301. (612) 253-5220.

General Surgeon/Family Practice. We are in need of qualified Family Practice/General Surgeon to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30 bed acute and 86 bed long-term care facility with a clinic located next to the facility, staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland providing rich recreational activities. For more information call/write James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072. (612) 245-2212.

MINNEAPOLIS AND SUBURBAN practice of 10 family physicians seeks eleventh Board Certified or eligible family physician to join group or locum tenens. Major hospital affiliation, three practice sites. Direct inquiries to Dr. Youmans or Mr. Nickolay, 1206-42nd Avenue North, Minneapolis, MN 55412, (612) 522-6601.

TWELVE-PHYSICIAN multispecialty clinic is in immediate need of Family Physician. Located Anoka, MN; pension, profitsharing plan. Busy practice in expanding north-suburban area. Please contact James R. Walker, M.D., at 421-3680.

East Range Clinics, Ltd. seeks physicians in the following specialties: obstetrics/gynecology, orthopedic surgery, ophthalmology, and internal medicine (with interest in cardiology, intensive care, or pulmonary medicine). Opportunity to enter established practice with progressive multi-specialty group of 26 physicians; unlimited opportunity for outdoor recreation. Contact Gary Lishinski, Administrator, East Range Clinics, Ltd., 910 North Sixth Avenue, Virginia, Minnesota 55792. (218) 741-0150.

Family Physician - Four man Family Practice group needs to replace two leaving partners. Board eligible or certified desired. One year salary with partnership thereafter. Would also consider longterm locum tenens. Small town in Central Minnesota Lakes area. Unopposed Family Practice Clinic, 150 bed Regional Hospital at Brainerd, 100 bed Nursing Home, rotate calls. Call or write C. R. Pelzl, M.D., Pine River Medical Clinic, Pine River, MN 56474. (218) 587-4416.

Busy, Established St. Paul four person Internal Medicine group needs a Board Certified Internist/ Endocrinologist to fill vacancy. Call (612) 645-5711, J. Wieler.

Family Practice - Northridge Family Medicine Clinic, P.A. is looking for a fourth BE/BC F.P. to practice in our new clinic facilities in Mankato. Contact Tony Giefer, M.D.; 1695 LorRay Drive, North Mankato, MN 56001 or call 507-345-5293.

Recruitment for Research Positions - Applications are invited for part-time Research Fellow (D.D.S. required) and/or Research Associate (Ph.D. required) positions at the University of Minnesota School of Dentistry. Applicants must have at least two years of research training. Positions will provide research expertise in planning and execution of research projects and instruction of students and technicians in research design and methodology. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities. Please send a brief resume and area(s) of research specialties (or request an application form). Bonita Bartholomew, University of Minnesota School of Dentistry, 15-174 Moos Tower, 515 Delaware St. SE., Minneapolis, Minnesota 55455.

Classified Advertisements

FAMILY PRACTICE OPPORTUNITIES — Locations are 30 minutes Southwest of Minneapolis, Minnesota. Established group needs physicians to help serve a growing region. "Convenience Care Clinic" opportunities also available. Contact Joseph Kandiko, M.D., or Mr. Michael Stein at (612) 448-2050.

IMMEDIATE OPENING- FAMILY PRACTITIONER River Valley Medical Center is seeking two family practice Board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90 bed hospital. We are within 45 minutes to the St. Paul/Minneapolis metropolitan area. Please contact: Dr. Carl Hansen, Recruitment Chairman or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024. Phone: (715) 483-3221.

EXPERIENCE BOARD CERTIFIED family physician with an interest in general adult medicine and minor surgery needed to fill vacancy in a 17 member multispecialty group. Will work closely with and share call with general surgeons. No obstetrics. Contact R.A. Yawn, M.D. or J.J. Sieve, Administrator, Worthington Medical Center, P.A., Worthington, Minnesota 56187. (507) 372-2921.

BOARD CERTIFIED INTERNAL medicine practitioner seeks board eligible/ certified internist to work with him with possible acquisition of practice in the future. Edina location. Reimbursement negotiable. Contact Jane Phillip, (C1575) Minnesota Medical Services Corporation, 2221 University Avenue Southeast, Minneapolis, Minnesota 55414.

RICE COUNTY DISTRICT ONE hospital seeks BE/BC Pediatrics, OB/GYN and Urology Practitioners for solo practice. Financial incentives negotiable. Faribault offers a modern 99 bed hospital. 21 physicians and primary service area of 28,000. None of specialties currently practice in community. Contact Gaylord Bridge, Rice County District One Hospital, 631 Southeast First Street, Faribault, Minnesota 55021. 507-334-6451.

ARIZONA BASED PHYSICIAN RECRUITMENT firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years experience. Call (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 N. Country Club Rd., Suite 202, Tucson, AZ 85716.

1986 CME CRUISE/CONFERENCES ON SELECTED MEDICAL TOPICS - Caribbean, Mexican, Hawaiian, Alaskan, Mediterranean. Seven to 12 days year-round. Approved for 20 - 24 CME Cat. I credits (AMA/PRA) and AAFP prescribed credits. Distinguished professors. Fly roundtrip free on Caribbean, Mexican and Alaskan cruises. Excellent Group fares on finest ships. Registration limited. Pre-scheduled in compliance with present IRS requirements. Information: International Conferences; 189 Lodge Avenue; Huntington Station, New York, 11746. (516) 549-0869.

WEEKLY SEMINARS - Most major ski areas, Club Med, Disney World, Cruising aboard sailboats in the Virgin Islands or a Mississippi paddlewheeler. Topic: Medical-Legal Issues. Accredited. Current Concept Seminars, Inc. (since 1980). 3301 Johnson St.; Hollywood, Florida 33021 (800) 428-6069. $175.

PEDIATRICIAN - Third BC/BE Pediatrician for current two-person department of eighteen member multispecialty group. Primary care pediatrics with active hospital practice. Contact Peggy Kulpa, M.D. or James Moore, M.D., Bloomington-Lake Clinic, 3017 Bloomington Avenue, Minneapolis, Minnesota 55407. 612 721-6511.

NEONATOLOGIST, BC/BE, to provide Level II-III neonatal care and develop neonatal transport system for progressive Upper Midwest 125 physician multispecialty clinic. 180-bed university-affiliated hospital with high risk obstetrics, neurosurgical, and cardiothoracic specialties; multiple ancillary services pertinent to neonatal care; and five associated hospitals in clinic network. Attractive community of 140,000 on North Dakota-Minnesota border offers three universities, fine cultural opportunities and close proximity to Minnesota Lake country. Competitive salary and benefits. Send CV and inquiry to: Minnesota Medicine (480), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414.

OFFICE CONDOMINIUMS 4928-30 Lincoln Drive, Edina. Two medical office condominums in central Edina location. Up to 3,000 square feet. Can be purchased separately or together. Perfect for a growing medical practice. Free parking. Priced to sell. Call Jim Moscowitz, Eberhardt Company920-9280.

Recruitment for Faculty Positions - Clinical faculty, rank negotiable, University of Minnesota School of Dentistry. Applications are invited for part-time consultative diagnostic and treatment planning services in specialty clinics. M.D. degree required. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities. Please send a brief resume and area(s) of clinical specialties (or request an application form). Bonita P. Bartholomew, University of Minnesota School of Dentistry, 15-174 Moos Tower, 515 Delaware St. SE., Minneapolis, Minnesota 55455.

Wanted: Family practitioner, OB/GYN. Group practice. Central Minnesota. Starting salary $45,000. Write Minnesota Medicine (755), 2221 University Ave. S.E., #400, Minneapolis, MN 55414.

Suburban Minneapolis Pediatric Practice desires full time pediatrician (board certified or eligible) to start April, 1986. Subspecialty interest in allergy or adolescent medicine helpful but not required. Busy diverse practice with good financial package. Contact: Gene Inett, Administrator, Metropolitan Pediatric Specialists, P.A.; 416 Southdale Medical Building; Edina, Minnesota 55435. (612) 920-9191.

Practice Opportunities Nationwide Midwest-Radiology, Oncology, Orthopedics, Dermatology; South-HMO Medical Director, Emergency, FP; West-OB, Surgery, Psychiatry, FP; East-Psychiatry, Emergency, FP. Call or write Jack Segall; Harper Associates, 15659 West 10 Mile, Southfield, Michigan 48075. (313) 557-1700

Bemidji Clinic, Ltd. offers excellent opportunities for well trained physicians. We are seeking Board Certified or Board Eligible physicians in Family Practice; Internal Medicine with interest in pulmonary medicine or cardiology; Ear, Nose and Throat; and Obstetrics/Gynecology. Bemidji Clinic is a 24 physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator or N.A. Skogerboe, M.D., Medical Director at (218) 751-1280.

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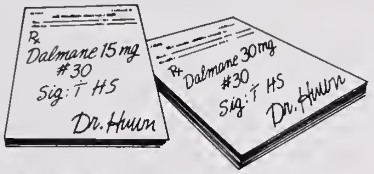

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Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported: headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of leukopenia, granulocytopenia, sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins, and alkaline phosphatase, and paradoxical reactions, *e.g.*, excitement, stimulation and hyperactivity.

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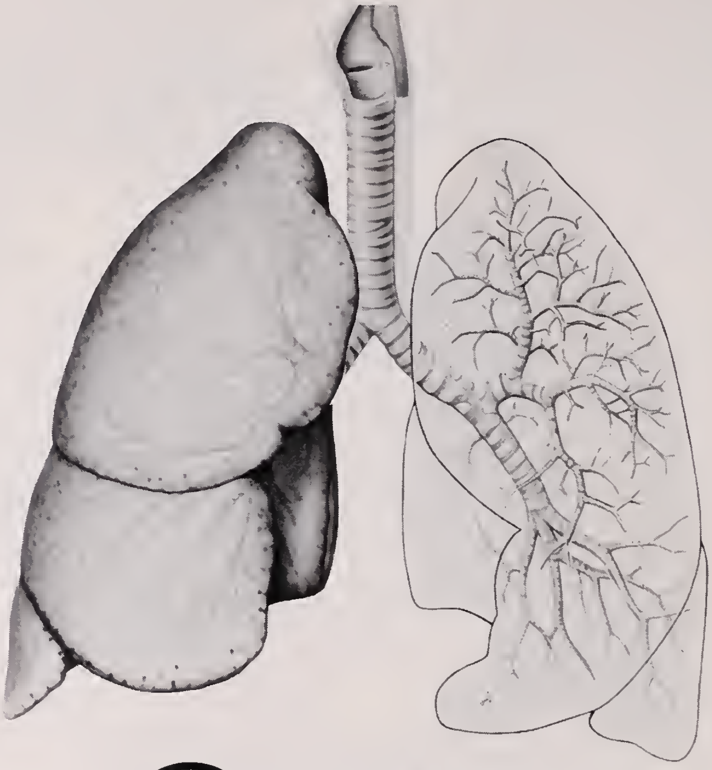
Consider the causative organisms...



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offers effectiveness against the major causes of bacterial bronchitis

H. influenzae, *H. influenzae*, *S. pneumoniae*, *S. pyogenes*
(ampicillin-susceptible) (ampicillin-resistant)

Brief Summary Consult the package literature for prescribing information.

Indications and Usage Ceclor* (cefaclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms

Lower respiratory infections, including pneumonia caused by *Streptococcus pneumoniae (Diplococcus pneumoniae), Haemophilus influenzae*, and *S pyogenes* (group A beta-hemolytic streptococci)

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Ceclor

Contraindication Ceclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics

Warnings IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES

Antibiotics, including Ceclor should be administered cautiously to any patient who has demonstrated some form of allergy particularly to drugs

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins), therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics Such colitis may range in severity from mild to life-threatening

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone In moderate to severe cases management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C difficile* Other causes of colitis should be ruled out

Precautions *General Precautions* – If an allergic reaction to Ceclor* (cefaclor, Lilly) occurs, the drug should be discontinued and, if necessary, the patient should be treated with appropriate agents, e g pressor amines, antihistamines, or corticosteroids

Prolonged use of Ceclor may result in the overgrowth of nonsusceptible organisms Careful observation of the patient is essential If superinfection occurs during therapy appropriate measures should be taken

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug

Ceclor should be administered with caution in the presence of markedly impaired renal function Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended

As a result of administration of Ceclor, a false-positive reaction for glucose in the urine may occur This has been observed with Benedict's and Fehling's solutions and also with Clinitest* tablets but not with Tes-Tape* (Glucose Enzymatic Test Strip USP Lilly)

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease particularly colitis

Usage in Pregnancy – Pregnancy Category B – Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Ceclor* (cefaclor, Lilly) There are however, no adequate and well-controlled studies in pregnant women Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed

Nursing Mothers – Small amounts of Ceclor have been detected in mother's milk following administration of single 500-mg doses Average levels were 0 18, 0 20, 0 21, and 0 16 mcg/ml at two, three, four, and five hours respectively Trace amounts were detected at one hour The effect on nursing infants is not known Caution should be exercised when Ceclor is administered to a nursing woman

Usage in Children – Safety and effectiveness of this product for use in infants less than one month of age have not been established

Adverse Reactions Adverse effects considered related to therapy with Ceclor are uncommon and are listed below

Gastrointestinal symptoms occur in about 2 5 percent of patients and include diarrhea (1 in 70)

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment Nausea and vomiting have been reported rarely

Hypersensitivity reactions have been reported in about 1 5 percent of patients and include morbilliform eruptions (1 in 100) Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthralgia and, frequently, fever) have been reported These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Ceclor Such reactions have been reported more frequently in children than in adults Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy No serious sequelae have been reported Antihistamines and corticosteroids appear to enhance resolution of the syndrome

Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients)

Causal Relationship Uncertain – Transitory abnormalities in clinical laboratory test results have been reported Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician

Hepatic – Slight elevations in SGOT, SGPT, or alkaline phosphatase values (1 in 40)

Hematopoietic – Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40)

Renal – Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200)

[0617B2R]

Note Ceclor* (cefaclor, Lilly) is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever See prescribing information

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President's Letter

Town and Gown — Friends or Foe

Peggy Craig

M. Elizabeth Craig, M.D.
President
Minnesota Medical Association

"Town and Gown." That phrase as I came into the practice of medicine represented a joint revenue between academia and clinical medicine. It was with a great deal of pride that new physicians moved from one to the other, keeping a respectful fondness for both of these important facets of medicine. Today the relationship has become an adversarial one. The "gown" that trained me and a majority of practicing physicians across the state is now courting patients from the "town," and the "town," increasingly for a number of years, has been doing much of the training for the "gown."

We hear today that the future of medicine is dependent on competition as opposed to regulation which none of us wants. As advertising has become acceptable for physicians we have seen advertising promotions of medical systems which would have been considered distasteful, if not down right unethical, a few years ago.

Our University has suffered for patients increasingly as the third party payors and a more liberal welfare system allows patients to seek care in the private sector, and the supply of well trained generalists and specialists has increased across the state making excellent specialty care available in one's home community.

It is understandable that some new effort is needed to provide patients to the University in order to continue the excellent physician training we expect from that institution. However, it is inconceivable that advertising efforts criticize and imply a lesser competence of the private physicians who have been trained by the University faculty. It seems most inappropriate for faculty to criticize in the public press the efforts of private practice in competitive medical care.

At the same time, I feel it equally inappropriate for an article highly critical of the University and its individual faculty to be published under a pseudonym in our state association journal. If one has strong personal feelings about a situation or an individual, the appropriate forum is in letters to the editor signed by the writer, be it in the public press or our own professional magazine. The facts are that in reality there is a great deal of cooperative daily effort in many situations between the University faculty and private practitioners in many situations.

Dissention within our professional ranks serves no good purpose. We are vulnerable and are the target of attacks from all sides as we try to perform our professional responsibilities, either academic or clinical. It has become increasingly more difficult, and in many instances less gratifying to battle the external forces trying to control our profession. We can't afford familial bickering.

The "gown" will not survive without the support and concern of the "town," and the "town" cannot function without the productive effort of the "gown." We need each other.

My hope is that in the interest of the continued promotion of our profession during this time of difficult and traumatic change in medical service we can appreciate our larger calling as our patients' advocates and work out our problems and differences without the devisiveness and acrimony we are now seeing. There is too much at stake to allow name calling to continue.

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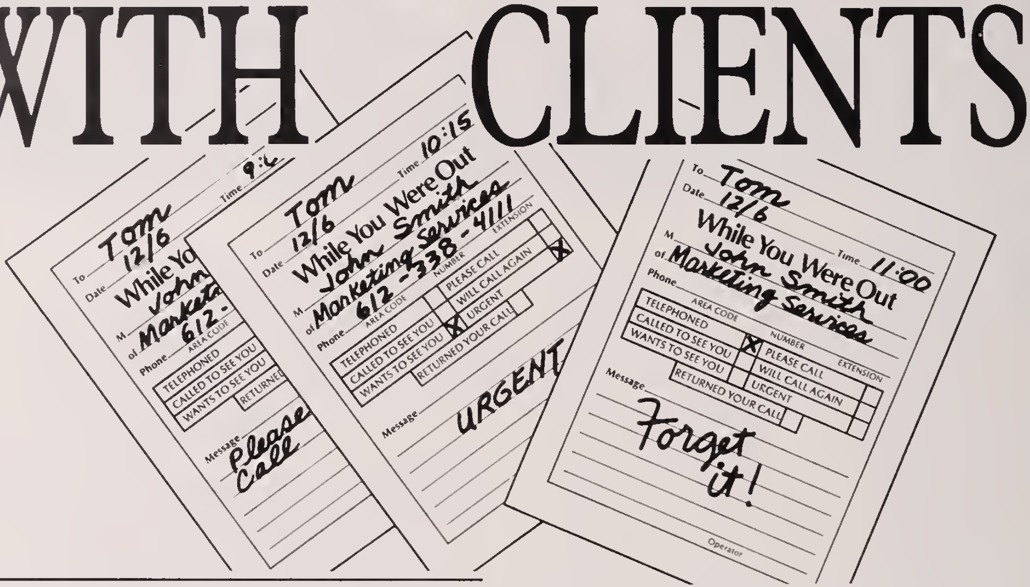
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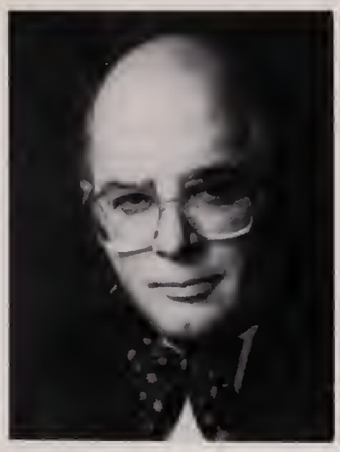

Editor's Notebook

The Corporate Transformation of Medicine in Minnesota The Position and the Positioning of Specialists in the Multiple Option Minnesota Medical Marketplace*

Sixteenth in a Series

"The social upheavals of the late 1960s, and the quieter changes of the 1970s, which spread 1960s' values throughout much of the traditional society, paved the way for the 1980s—a decade of unprecedented diversity. In a relatively short time, the unified mass society has fractionalized into many diverse groups of people with a wide array of differing tastes and values, what advertisers call a market-segmented, market-decentralized society. Much of the multiple-option nature of the United States is addressed to our own individuality . . . the computer will be what smashes the hierarchical pyramid: with the computer to keep track of people and information, it is no longer necessary for organizations to be organized into hierarchies."

John Naisbitt, *Megatrends: Ten New Directions Transforming Our Lives,* Warner Books, 1982 and 1984

Bloomington, Minnesota - Members of the Academy of Ophthalmology, members of the Academy of Otolaryngology, Head and Neck Surgery, spouses and guests.

Tonight I shall speak on your position in the Minnesota medical marketplace and on how you might position yourself to take advantage of the multiple options now being offered health care consumers.

In developing my theme, I shall give you background on economic, social and psychological forces at work in our society. Before I get to the heart of this presentation (some say my presentations have no heart), I would like to examine why I am here.

Questioning Your Wisdom

No doubt you have your reasons, but I question your professional wisdom in inviting me to speak. To ask a nearsighted pathologist to give a farsighted view of the future doesn't make sense. To add to your folly by asking a hard-of-hearing editor to relate what his ears have detected in the Minnesota medical marketplace borders on the absurd. And to compound your error by inviting an amateur speaker to stand in for Lou Holtz, a professional platform virtuoso who now sits at the right hand of God as head coach of Notre Dame, strikes me as ridiculous. What can I do to match the charismatic Lou Holtz, who exudes an irresistible mixture of evocative evangelism, positive thinking, and sheer chutzpah.

A Long Distance Call to Lou

After you invited me here, I had second thoughts. I didn't know to whom to turn. So I phoned Lou to solicit his advice. For your information, his South Bend number is 1-219-OURLADY.

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*Presented before the Academies of Ophthalmology and Otolaryngology - Head and Neck Surgery, Decathlon Athletic Club, January 11, 1986.

Well, Lou said, on first down in Minnesota in the winter, execute the SOB Option (that's short for South Bound option). You hand off at the Minnesota-Iowa line and head south. You can veer right to California, go straight to Texas, and veer left to Florida or the Caribbean.

On second down, sneak into the line to get to know your customers. How do you know them, I asked. Well, in Minnesota, he said, they are the ones with the blue eyes, blue noses, blue ears and red throats.

On third down, plunge up the middle and hit your competitors head on. "What do I do when I'm head to head with them," I asked. Lou responded: "An eye for an eye, and a tooth for a tooth." "No, Lou," I explained, "It's ophthalmologists and otolaryngologists, not ophthalmologists and orthodontists."

"Look," he said, "for what they were going to pay me, who cares? Besides, what do you expect from someone who is myopic, doesn't hear well, weighs 152 pounds and finished 224th in his class of 276?"

Fourth Down - a Punning Situation

Lou's advice didn't help. It was fourth down, a punning situation. So, on the way from the *posterior chamber* of my home to the *anterior chamber* of this room, I came up with appropriate *global humor*.

Before I *cleft* home, I *earnestly* promised my wife I would go lightly on the eye and ear puns. But I can't stop completely. After all, "To *ear* is human, to conceive divine." I said, and I added: "I will just give them my two *senses* worth."

Puns, after all, are a form of *vitreous humor*, not *vit* for *serious* people. Each pun is *cornea* than the next, but *lens* fun to create than you might blink, even only a *schlemm* chance your listeners will understand your puns.

My wife dislikes my puns, but at least they break up the *monogamy* of our marriage. Never let your puns lie doormat. Otherwise, people will think you're henpecked.

But I did promise her not to tell the tale of the ophthalmologist who fell into a lens-making machine and made a *spectacle* of himself. He filed a claim against the lens-maker, saying he had been *framed*. He rushed into the *temples* of justice, only to find he had no *case*, *hard* or *soft*. The jury couldn't decide which *vision* of the case to accept - his or the lens-maker. In the end, he didn't even have a *pad* on which to rest his *frame*.

Perhaps you don't care to ear such a *spectacle*r story - such a *tragusy* of justice. It simply *ENT* the way life ought to be. But it is a *sinus* of the times.

I told my wife I wouldn't let my puns *deviate* anybody's septum. My puns are so *oculist*, nobody can *cataract* them anyway. A few puns are *cryptic*, some are *optic*, most are *alimentary*. Besides, I added, this crowd - a *detachment* of ophthalmologists and a *gargle* of otolaryngologists - will be *refractory pupils* with *cerumen* in their *lumens*. They will be *macula densa*, with *pinpoint* understanding and a complete lack of *focus* after *eyeballs*. Those with too many *eyeballs* in their entrails will be lost in *ciliary* and *ciliary* fantasies, such as hunting charging *rhinoplasties* in Africa or cultivating irises in January.

Of course, I may have to explain my puns *stapes* by *stapes*. Maybe I'll even have to write them out with *pinna* and *incus*. Puns don't suit everyone's palate, or even their uvula, some will never like them, not now, and not *tonsil* hell freezes over. But who knows? My puns may tickle the *cochlea* of their hearts, and the *labyrinthes* of their minds. *Uvea* never can tell how people will react if you go *choroin* around the globe with wild young puns, local *bifocals*, and other bivalent species.

Enough *puntificating*, enough *fundra* on your tundra. I'll stop *pun*ishing you with this *punitive* humor before you toss me into the *punitentiary* for public punning. I know I'm quitting *retina* in the *neck* of time. It's *laser* than I think.

EDITOR'S NOTEBOOK

Forces at Work

What are the forces that are transforming your economic lives as surgical specialists? How can you position yourselves to go with the flow of these forces? As I was moving my library into my office this week, it dawned on me how I might sum up these forces. Three of the books I was lugging were: (1) *Megatrends: Ten New Directions Transforming Our Lives,* by John Naisbitt; (2) *In Search of Excellence: Lessons from America's Best Run Companies,* by Thomas J. Peters and Robert H. Waterman; and, (3) *Innovation and Entrepreneurship: Practice and Principles,* by Peter F. Drucker.

For understanding what makes American society work and who and what organizations succeed, I recommend these books. Consultants wrote each of them, and each author codifies what he sees happening in America.

Megatrends

Let's crisply sum up each book, and if it relates to what's happening to your practice. Naisbitt says the ten trends transforming our lives are these:

1. *We are going from an industrial society to an information society.* This means those health plans with the best computer systems will probably do the best.

2. *We are changing from forced technology, i.e., mass marketing of industrial products, to a selective high touch/high tech society,* where people strike a balance between machine demand and human wants. In the future, you will observe that HMOs, hospitals, and physicians will spend a lot of time blending their technologies with human amenities.

3. The national economy is being transformed into an international economy. Here, you need look no further than Minnesota's World Medical Conference. This conference will take place in May, 1986 and is designed to promote Minnesota medical products, clinical and industrial, throughout the world.

4. *We are altering our thinking from short-term goals* - what to do with the next patient - *to long-term goals* - where are our practices going to be five years from now?

5. Our society is shifting from *centralized* to *decentralized* organizations, i.e., in-patient to out-patient facilities, and from staff HMOs to HMOs without walls.

6. *Instead of seeking help from institutions, i.e., hospitals, Americans are turning to themselves and others for solutions,* e.g. to fitness, to home health remedies, and to self-help groups.

7. *America is going from a representative democracy*—where we select someone to do something for us, such as a doctor—*to a participatory democracy*—where, for example, patients demand a greater voice in their own care.

8. *We are more and more skeptical of hierarchies,* e.g., staff model HMOs, and turning to networking, i.e., being members of smaller clinics and groups and branching out from there.

9. *We are migrating from the north,* e.g., Rochester, Minnesota, *to the south,* e.g., Jacksonville, Florida or Phoenix, Arizona.

10. *We are shifting from an either/or mentality*—either you belong to an HMO or pay fee-for-service rates - *to a multiple option mind-set.* People want to go to a health plan or to a clinic that offers them multiple options. These options may include an HMO, particularly that refers them to an institution of their choice, a modified fee-for service with co-payments and co-insurance but with flexibilities of choice; a PPO which rewards them for using a preferred organization; and traditional indemnity insurance with a high deductible, low premiums, but comprehensive benefits. People, in other words, are seeking one-stop health shopping.

Search for Excellence

Peters and Waterman say the best-run companies and presumably the best run practices share these eight traits:

1. *They have a bias for action - for doing something - anything* - like promptly deciding to have your clinic open late hours and being open on weekends rather than agonizing about the costs and problems of doing so.

2. *Thay stay close to the customers - learning their preferences* and *catering to them.* One way of doing this is sending questionnaires to your patients; another is to note on your patient's chart some personal information you can use on a subsequent visit; still another is to ask your patients to write out their questions that are bothering them and to answer those questions before the patient leaves the office.

3. They practice autonomy and entrepreneurship - breaking your large clinics into smaller units and encouraging them to think independently and competitively. Consultants tell me the most productive medical groups - those with the smallest number of employees per doctor - number from 4 to 6 and are in independent practice. One of the troubles with large HMOs is that they suffer from increasing overhead costs and decreasing clinical output by physicians.

4. *They aim for productivity through people* - creating in *all* employees the awareness that their best efforts are essential and that they will share in the rewards of the practice's success. This can be done by instructing your staff in:

   A. Relating to patients;

   B. Clinical interaction; and

   C. Financial and administrative organizations. For details on how this is done, I recommend *Practice Enhancement: The Physician's Guide to Success in Private Practice* by Greg N. Korneluk.

5. *They believe in hands-in, hands-on, value-driven practices* - insisting leaders keep in touch with the organization's essential business. This isn't hard in your practice, but you also ought to do things like talking to senior citizen groups and intermingling with them to understand how they feel.

6. *They stick to the knitting* - remain with the business the company knows best. With doctors, this means sticking to what you know best - practicing

medicine. If you have business marketing or management concerns, call in an outside consultant - from the Minnesota Medical Association, from independent firms, from hospitals, or from HMOs. There are other bodies of knowledge outside medicine.

7. *They retain a simple form and lean staff - few administrative layers, few people at the upper levels.* You don't need to be told this: I have seen too many doctors froth at the mouth at the excessive layers in hospitals, in HMOs.

8. *They have simultaneous loose - tight properties - fostering a climate where there is dedication to the central values of the company combined with tolerance of all employees who accept those values.* This means you should rigidly control - by keeping your central values straight and by paying attention to detail - while at the same time, promoting autonomy, entrepreneurship, and innovation among your partners and employees.

Innovation and Entrepreneurship

And lastly, let's take a look at Drucker's seven conditions of change from which all true innovation flows. He calls these the seven sources of innovative opportunity;

1. *An unexpected change - an unexpected success, an unexpected failure, an unexpected outside event* - a controversial example in ophthalmology is the development of the radical keratotomy technique, an idea which sprung from the improved vision from a slashed cornea after an automobile accident.

2. *The incongruity - a discrepancy between "what if" and "what ought to be."* Health care, for example, has been exploding at 2 to 3 times the Consumer Price Index for the last 20 years. Yet, the incongruity is that it has become increasingly inefficient, especially in hospitals. This has created the innovative opportunity for hospitals to "unbundle" for more services outside the hospital - to the Phillips Eye Institute, to the Abbott-Northwestern Eye Center, to the Minnesota Ear, Head and Neck Center, and to joint ventures like Headache Clinics.

3. *Innovations based on process need - this is the invention or opportunity, maybe even something that has existed for a long time that solves a process need.* An example is found in the story of pharmaceutical company salesman William Connor who found out 25 years ago that an enzyme isolated in 1890 which dissolves a ligament in cataract surgery could be kept fresh under refrigeration using a special preservative. Now, every eye surgeon uses Connor's patented compound.

4. *Changes in industry structure or market structure that catches everyone unaware.* A good example is the passage of DRG legislation, a radical sudden change that ended cost-plus reimbursement and changed cataract surgery from an in-patient to an out-patient procedure. Soon, 500 more procedures will be done on an out-patient basis. Innovators who design, build and staff surgi-centers are going to make a lot of money.

The remaining three sources of innovation include changes that occur outside the enterprise:

5. *Demographics.* The graying of America is no secret to you. For ophthalmologists, 90 percent of your cataract patients are Medicare recipients. Many

head and neck tumors, particularly malignancies, fall into this category. Simultaneously HMOs have made a move on Medicare patients, going from zero to 30 percent market share in the Twin Cities in five years. Your opportunity maybe to band together to achieve a critical enough mass of capital, management, and marketing skills to link yourselves with HMOs, preferably multiple HMOs, to care for the elderly.

6. *Changes in perception, mood, and meaning*. In America, we have had a profound change in perception about disease. We no longer talk of medical care. It is health care. Instead of worrying about disease, we are obsessed with health and fitness and growing old. As a result, the opportunities for innovation in your field may be dispensing contact lenses, prescribing undetectable hearing aids, in plastic surgery of the ears, eyes, nose, face and neck, and in offering educational programs that inform patients in a systematic, organized, and purposeful way how and when and why these youthful image devices and procedures ought to be used. Americans want to improve their appearance and thereby the quality of living.

7. *And lastly, there is new knowledge, both scientific and non-scientific*. Here I shall use the example of the computer. The computer required the convergence of five kinds of knowledge - the scientific invention, the mathematical discovery, a new logic, the design of the punched and concepts of program and feedback. You can use the computer to innovative effect. In your office, you can use a computer to collect demographic information, to catalog diagnoses and procedure, to evaluate practice costs, to store financial records, to retrieve charts and to write papers, to schedule patients, and for word processing. the latter is overlooked. You can use the computer to write consultative letters, to send birthday greetings to patients, to announce new office hours, and so forth.

Your Position in the Market

I have both good news and bad news for you. The good news is your patients, particularly eye patients, tend to be loyal. After all, who wouldn't be if you had your vision and hearing restored or your nose fixed. Your incomes are higher than primary care or cognitive specialists, by a ratio of roughly 1½ to 3. There are still not too many of you—222 ophthalmologists and 105 ENT people in Minnesota. I've been told both of you are slightly under the national average for numbers of specialists/100,000 citizens. And your arsenal of high technology and its effectiveness in attacking cataracts, retinal disorders, hearing defects, and head and neck problems is awesome.

The bad news is that you are vulnerable, ophthalmologists particularly, but procedure-oriented specialists generally. Because 50 percent of the ophthalmologist's income may come from cataract surgery, and because the cataract DRG represents the single greatest cost among DRGs to the government, you may feel exposed to capricious and arbitrary government action.

In the new marketplace, primary care specialists are a more fundamental source of revenue to HMOs than specialists. Many people feel the current proportion of specialists to primary care physicians, 2 to 1, is too high, and so is the income differential, about $135,000 a year compared to about $85,000.

As gatekeeper HMOs evolve, these differences will certainly shrink, and if the government imposes a capitation payment for Medicare or even physician DRGs, this differential will also narrow. And, finally, as you know, the differential between specialists and primary care physicians within HMOs is much less than on the outside. If current HMO growth continues, or if the government introduces new relative value fees, physician DRGs, or a capitation system, your income will likely decline.

The government now has a number of groups from universities and other specialty groups deciding what the relative value scale for cataracts ought to be. Rumors persist that the fee may be reduced by as much as half its present value. There are also rumors that there will be legislation that will not permit assistants at cataract surgery to be paid unless a peer-review organization clears that assistant before surgery.

Because of your high incomes and isolated examples of ophthalmologist abuse and fraud with Medicare patients, the media and congressional committees have targeted ophthalmologists. You make good copy, and your case helps the government create a climate for change for reimbursement of all physicians. Already many ophthalmologists and otolaryngologists are anticipating these downward trends by introducing dispensing shops for glasses and hearing aids to broaden and diversify their revenue base.

Among other physicians, you have the reputation of practicing a superior brand of medicine with excellent outcomes. Certainly, we recognize both of you effectively diagnose and treat cataracts, retinal disorders, hearing defects, and diseases of the head and neck. We are aware of the ophthalmologist's battles with optometrists and the ethical questions surrounding the dispensing of glasses and hearing aids, but by and large, we do not spend much time fretting about these issues.

What disturbs some physicians, particularly those in cognitive specialties, is your sheer technological capacity to generate large incomes through your procedures. In Minnesota, ophthalmologists' average income is about $150,000 a year, while primary care specialists average about $80,000.

Ophthalmologists have been fortunate because your specialty lends itself to technological innovations. These innovations produce dramatic benefits to patients that are plain for all to see, and the benefits occur in the most rapidly exploding segment of the population - the aged. Consider these eight most growing surgical procedures performed on Medicare patients from 1972 to 1981. Three of the eight procedures are ophthalmological, and in 1981, ophthalmology operations represented 56 percent of these procedures.

	Number of Cases in those 75 or Over		
Surgical Procedure	*1972*	*1981*	*Fold.Increase*
1. Cataract surgery with lens implant	800	240,100	3010 x
2. Coronary artery bypass	2,600	52,800	20 x
3. Endoarterotomy	15,700	78,200	5.0 x
4. Hiparthroplasty	25,000	111,700	4.5 x
5. Cataract surgery with lens implant	183,800	399,400	2.2 x
6. Carcinoma of rectum	9,900	19,600	2.0 x
7. Prostatectomy	162,400	259,200	1.6 x
8. Retinal detachment surgery	9,900	14,400	1.5 x

Table 1 - Trends in Surgical Volume in Medicare Patients. From "Rising Rates of Surgery among the Elderly. Health Affairs 4:108-118, 1985.

Other physicians do not question ophthalmologists' skills. Indeed most of us would concede that a skillful ophthalmologist could do 5 cataracts in a given day with good results, few complications, and grateful patients.

But we have a tough time imagining the $7,500 to $10,000 income these procedures could conceivably produce in a given day. An uncomplicated cataract operation can be done in less than an hour. There is more to this feeling than collegial jealousy, or a yearning for egalitarianism. After all, what do you say to critics of the profession, particularly students of Medicare fees, when they bring up the case of a Florida ophthalmologist who generated $6 million of fees last year, or the sizable numbers of ophthalmologists who will bill Medicare for more than $1 million.

I have nothing against large incomes: some specialists earn large incomes because of their world-class skills; others because of a reputation earned among grateful patients; others because of a knowledge of outstanding results among referral sources.

But, among journalists and certain congressmen, you have an image problem. There is a growing schism in American medicine between the cognitive and procedural physicians because of income differences. Many regard the differences in compensation as more of a historical accident of the fee-for-service system which rewards the concrete rather than the abstract and the high tech rather than the high touch.

Positioning Yourself in the Market

But there are fundamental steps you can take to position yourself in the Minnesota medical marketplace.

- One, of course, is to come up with a marketing plan that positions you in a special niche in the market. For this purpose you can use medical marketing specialists from the medical association, hospital-based marketing people, HMO-related marketing people, or your own good sense, coupled with reading books like *Practice Enhancement*. Basically what you have to do is think through the four P's of marketing—what is your *product*, how should you *price* it, what *place* should you be in, and how should you *promote* yourself. In health care, promotion, especially advertising, is the least effective.

- Another tried and true and proven method is to subspecialize. Both of you have done this—we have neuroophthalmologists, retinal people, and cosmetic lid surgeons. and the otolaryngologists have split into ear, head, and neck physicians. Microsurgery has revolutionized otology, and cancer and plastic surgery of the head and neck.

- Yet another tactic is to form umbrella organizations of your own specialty and of other specialties. The VISTA Group in St. Paul is a consortium of 175 specialists who handle HMO patients on a capitation basis from multiple clinics. Setting up these organizations requires legal, accounting, and consulting help.

- Then, of course, you can form centers of excellence, institutes, or boutiques as a joint-venture with hospitals. Your specialties lend themselves to this approach. You can do your surgery in detached buildings; you can build identity and brand name; and you can have the hospital provide capital, management, and marketing skills. This approach gives you the critical mass of skills, from various disciplines outside of medicine, to make the thing go. There are now multiple variations off this theme—the Phillips Eye Institute, which now has 95 ophthalmologists; its competition at Abbott-Northwestern; and the Minnesota Center for Ear, Neck and Head Surgery at St. Mary's.

- Do a little management by wandering about. Talk to senior citizens groups, call the local chapter of AARP and other beneficiary-age groups—listen to what their concerns are.

- Still another is to recognize that your specialties are rapidly changing from fee-for-service payment to multiple form of payment—to contract payment. The following table will give you some sense of expected rapidity of this change.

	1984	1985	1986	1987	1988	1989	1990
Fee-For-Service	89%	72%	42%	25%	15%	10%	5%
Managed Fee-For Service	3%	15%	36%	40%	38%	31%	25%
PPO	1%	4%	10%	20%	28%	35%	40%
HMO - IPA	3%	4%	7%	9%	13%	17%	22%
HMO - Group Staff	4%	5%	5%	6%	6%	7%	8%

Table 2 - Private Pay Segmentation in United States by Type of Practice. Source: Blue Cross, Interim Study, and Bernstein Estimates.

Those of you in private offices, at least those with the foresight to arrange contracts with HMOs, PPOs, discounted fee-for-service plans, hospitals, industries, or even other physicians, will undergo a resurgence. Physicians who offer multiple options will thrive. To do this, you will have to do two things: (1) you must affiliate with large organizations that have the marketing, management, and computer capacities to offer these multiple options to a diversity of consumers spread over wide geographic regions; and (2) they must group together to pursue multiple options on their own. Multiple option health care - those with a diversified product line of multiple plans - will continue to gain market share at the expense of clinic-type HMOs.

This recent squib in the December 19, 1985 issue of the *Wall Street Journal* nicely sums up this trend:

> "More doctors join health maintenance organizations to cure practice woes. Surgeon Richard Egdahl, Director of the Boston University Medical Center, joins two HMOs, saying it ensures patient referral. Many claim HMOs mean survival in face of growing doctor surplus. 'The only way a newly-trained doctor in northern California can make a living is probably to sign up with an HMO,' says Alain Enthoven, an economist at Stanford University. Statistics show about one-quarter of all practicing doctors participated in HMOs last year, up 84% from the number affiliated in 1980."
>
> Doctors originally opposed HMOs, which provide comprehensive health care at a fixed price. But the number of HMOs has exploded in recent years as employers seek to control health care costs. Paul Ellwood, a consultant, forecasts that half of the U. S. population will be in HMOs by 1994. "Lots of physicians are hedging their bets by joining more than one," he says.
>
> Yet most doctors shun clinic-type HMOs, preferring HMOs that allow them to continue private practice."

Physicians with Practices Are in Demand

What is happening? Hospitals want to join with physicians in joint ventures to assure hospitals a stream of future patients; HMOs want their practices as satellite access points so HMOs can maintain their historic growth patterns; and employers, employees, self-employed persons, and retirees want them to satisfy their appetites for choice, independence, and multiple options.

The Drive for New Options, New Alliances, and New Contracts

In all health care sectors, people are seeking options, diversity of plans, and multiple geographic access points. Entrepreneurs, managers, and entrepreneurs within health care corporations are rapidly innovating to exploit this new desire for multiple options. The option explosion has arrived. And so has the explosive search for new alliances - HMOs with hospitals, HMOs with fee-for-service doctors, doctors with doctors, doctors with hospitals, and hospitals with other hospitals. The distinction between fee-for-service and HMOs is rapidly disappearing, and the phrase "contract medicine" fills the air.

The Bandwagon Theory

Why the flurry of activities and the innovative scramble for new options, for choices of "product lines," for "market positioning," and for market research to determine precisely the right "niche" in the market? As Paul Ellwood has said, among doctors and nurses, hospital administrators, medical-school directors, health-industry suppliers, and myriad health-care entrepreneurs: "There is an apprehension about missing the bandwagon, especially when that bandwagon can either put you out of business or turn you into a millionaire." He concedes many doctors are in economic and professional jeopardy and says the fate of many of these doctors will result in "messy, unhappy endings."

The Growth of Entrepreneurial Medicine

What Ellwood may not have foreseen is that many doctors will do very well practicing outside of, or independently contracting with, HMOs. Indeed, although it goes against the grain of conventional wisdom, I believe HMOs that employ doctors directly may represent only a transitional phase on the way to a market consisting of organized systems of interconnected entrepreneurial practices pitted against the so-called SuperMeds, i.e., National Health Care Corporations offering an umbrella of diversified services and products under one corporate roof. I believe the smaller enterprises are going to grow faster than the giants, although many will be bought out in the process.

The New Reality

I believe we are in an exciting new phase for private practice. The overall market has been discounted, and the price differences between multiple options are either small or understood.

Minnesotans are adjusting fast to the new reality: that patients like to go to their own doctors, especially if those doctors offer them multiple options - fee-for-service, managed fee-for-service, PPOs such as AWARE Gold, IPAs such as PHP, and flexible options such as referrals to the University of Minnesota or the Mayo Clinic. Furthermore, smart Minnesota doctors know patients have widely differing tastes and values, and if you make your office or your health plan or HMO a place for one-stop health shopping, you are well ahead of the game.

I believe: (1) The growth of Twin Cities' HMOs has peaked, or at least HMOs are no longer growing as closed panel groups or in centralized locations; (2) resistance to HMO growth has stiffened among those who pay for, deliver, and receive health care, (3) HMO competitors are now offering services with traditional HMO advantages - comprehensive outpatient care at affordable prices - but with non-HMO advantages of choice of specialists, wider geographic access, and flexibility of multiple options; and (4) organized systems of fee-for-service or contract services are emerging among heretofore independent physicians.

Conclusion

In conclusion, keep your eyes open, your nostrils flared, your ear to the ground, your options open, and your attitudes about method of payment flexible. Finally, don't be too much of a purist - fretting too much about how you're paid, how good were the good old days, or how much this world is changing.

Richard L Reece MD

Ninth Annual Black Hills Seminar

The Ninth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 18, 19 and 20, 1986, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include: Drs. James Corrigan, Jerome Klein, George Little, and Lynn Taussig. For complete conference information contact:

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Candidates for 1986 Offices Nominated

These profiles are of physicians nominated by the MMA for election at the 1986 MMA House of Delegates' meeting on May 2nd, 1986. Nominations may be made from the floor of the House.

President-Elect

L. Ashley Whitesell, M.D.

L. Ashley Whitesell, M.D., is vice president of the MMA and has been a member of the MMA House of Delegates since 1970. Dr. Whitesell served on several MMA committees including the Rural Health and Legislative Committees. He chaired several Reference Committees and is a member of: Wright County Medical Association; Minnesota Medical Association; American Medical Association; Minnesota Academy of Family Physicians; American Academy of Family Physicians. An assistant clinical professor of Medicine in the Department of Family Practice and Community Health at the University of Minnesota, he is also board certified in family practice.

Thomas Love, M.D.

Dr. Thomas Love has been in the private practice of urology in St. Paul since 1972. Dr. Love has been a delegate to the MMA from Ramsey County since 1980, and is currently an MMA trustee from East Metro. He was appointed to the Metropolitan Health Planning Board in 1975; chairman of the Physicians Metro Health Task Board in 1983; president of the Ramsey County Medical Society in 1984; and president of the Minnesota Urological Society in 1985. Dr. Love received his M.D. from the University of Colorado, and served in the U.S. Navy as chief of urology at Naval Hospital in Boston from 1970 to 1972.

Vice President

Gail L. Gamble, M.D.

Dr. Gail L. Gamble is a board certified specialist in Physical Medicine and Rehabilitation practicing in Rochester. Active in MMA for many years, she has served as a delegate to the MMA House since 1976; MMA Board of Trustees member for two years representing medical students and residents; member on MMA Membership and Administration and Finance Committees; and many Reference Committees. Locally, Dr. Gamble has served the Zumbro Valley Medical Society as president in 1984, and secretary-treasurer in 1982 and 1983.

1986 OFFICERS NOMINATED

Secretary

Janice Ophoven, M.D

Dr. Janice Ophoven is the chief pathologist at Children's Hospital of St. Paul. After graduating from the University of Minnesota Medical School, she completed pediatric and pathology residencies and a fellowship in forensic medicine. Dr. Ophoven has been active in the Minnesota Medical Association serving as the chairman of the Medical Practice and Planning Subcommittee on Organ Transplantation. Her major career interest is evaluation and documentation of child abuse.

Treasurer

Joseph A. Cella, Jr., M.D.

Board certified in obstetrics and gynecology, Dr. Joseph A. Cella, Jr. practices in Minneapolis with a specialty group. He was elected treasurer of the MMA in 1984, after serving on the MMA Administration and Finance Committee for ten years.

Dr. Cella also served in the MMA House of Delegates and in the Hospital and Professional Relations Committee. He is active in the Minnesota Division of the American Cancer Society as a past president, and he was president of St. Mary's Hospital in 1974. He is a member of the AMA and the Hennepin County Medical Society.

Speaker of the House of Delegates

Richard K. Simmons, M.D.

Dr. Richard K. Simmons is serving his fourth term as speaker of the MMA House of Delegates. A former vice speaker of the House, Dr. Simmons served as an MMA delegate from 1975 to 1979. He is board certified, has practiced family medicine in Bloomington since 1958, and has held numerous positions in the Minnesota Academy of Family Physicians. Dr. Simmons served for three years on the Board of the Hennepin County Medical Society, and is currently Medical Director for Physicians Health Plan. Dr. Simmons is an active member of the MMA Executive Committee and is also a member of the AMA.

Vice Speaker of the House of Delegates

John E. Sutherland, M.D.

Dr. John E. Sutherland is an assistant professor at the University of Minnesota Medical School, and program director of University Affiliated Community Hospitals Residency in Family Practice. He has formerly practiced at the Mayo Clinic in Rochester, Northwest Family Physicians in Robbinsdale, and Doctors Plaza in Marshall. Dr. Sutherland is certified by the American Board of Family Practice. Current service to the MMA includes his second term as Vice Speaker of the House, chairmanship of the Interspecialty Council, and membership on the Communications Committee. Dr. Sutherland has also been a delegate to the MMA House of Delegates.

Tubal Pregnancy Treated by Laparoscope

CHARLES A. TIETZ, M.D., F.A.C.O.G.*

Some ectopic pregnancies can be treated through the laparoscope without subsequent laparotomy. These patients can be treated as outpatients in a "same day surgery setting." This is less painful to the patient as well as more cost effective.

The advent of sensitive blood pregnancy tests has greatly enhanced the early diagnosis of pregnancy. These tests have been invaluable in the diagnosis of suspected ectopic pregnancy. Ultrasound, of course, has also been extremely useful in differentiating intrauterine pregnancy from ectopic pregnancy.

If clinical suspicion of ectopic pregnancy is substantiated by a positive serum or sensitive urine pregnancy test, and ultrasound if available shows an empty uterus with or without suspicious adnexal or cul-de-sac findings, a laparoscopy is probably the next step.

Tubal pregnancy, diagnosed early enough, often times is accompanied by little or no intraperitoneal blood loss. This allows for a complete visualization of the pelvic contents at laparoscopy. If you are confident that the uterus is empty of products of conception, use whatever instrument you are comfortable with to allow the uterus to be moved to obtain a complete view of both fallopian tubes. I use a packing forceps.

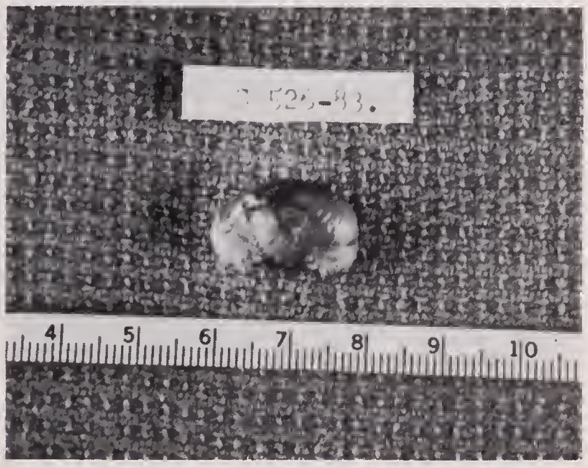
Many patients with tubal pregnancies have had previous sterilization procedures because they are undesirous of future pregnancy. Even so, most would be grateful to be spared a laparotomy. I have successfully treated six tubal pregnancies in the last four years by laparoscopy without subsequent laparotomy.

Preoperatively, you must discuss the options with the patient and obtain informed consent. Explain to the patient and any family member present (i.e. husband) what is contemplated. If you are going to treat the tubal pregnancy through the laparoscope, you must explain that the affected tube will be destroyed with electrocautery. If the patient desires no more pregnancies, obtain consent to fulgerate the opposite tube as well, since in "failed sterilization" procedures, the recanalized tube may not be on the side where the ectopic pregnancy is located. I use a single puncture standard operating laparoscope. Once the tubal pregnancy has been isolated, the mesosalpinx is grasped with the operating forceps proximal to the ectopic pregnancy. The proximal tube and mesosalpinx are coagulated till a generous portion of the mesosalpinx is blanched white well below the inferior level of the ectopic pregnancy. Then the portion of the tube and mesosalpinx distal to the tubal pregnancy is grasped and coagulated in a similar manner.

Next, with an operating scissor through the scope, the tube and mesosalpinx proximal and distal to the pregnancy are cut. Then coagulate and cut the mesosalpinx under the tubal pregnancy if you are going to attempt removal. Make sure the mesosalpinx is coagulated thoroughly and, of course, keep bowel and other vital structures free of the cautery forceps.

If the tubal pregnancy is large, you may have to cauterize it completely before coagulating the tube and mesosalpinx. I cauterized the tubal pregnancy completely in three of my six cases. If you choose to simply coagulate the tubal pregnancy completely and the mesosalpinx with its accompanying blood supply, this is satisfactory treatment. It will simply turn to scar tissue.

In three of these cases, I was able to cut the tubal pregnancy from its attachments and remove it with the laparoscope and its forceps through the trochar sheath, thus providing a specimen for pathology. See the Figure. A serum pregnancy test was obtained seven to ten days after surgery in all six cases and in all cases, it was negative.



Figure

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*Department of Obstetrics and Gynecology, Medical Specialists, Inc., Virginia, Minnesota.

The six patients were treated as outpatients and discharged in an appropriate time after proper recovery from anesthesia.

Summary

It is possible to treat selected tubal pregnancy cases through the laparoscope without laparotomy. These patients are treated as outpatients, reducing hospital costs, to say nothing of the discomfort and extra hospital stay the patient is spared.

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Simultaneous Cholecystocutaneous and Cholecystoduodenal Fistulae

ISHIK C. TUNA, M.D.*; SCOTT MAIZEL, M.D.*;
MELODY O'CONNOR, M.D.*; and
EDWARD W. HUMPHREY, M.D.*

An unusual case of simultaneous cholecystocutaneous and cholecystoduodenal fistulae is presented. The initial clinical presentation consisted of a painless right upper quadrant abdominal wall abscess with no previous history of abdominal trauma or gastrointestinal symptomatology. Radiologic studies yielded a diagnosis of cholelithiasis complicated by multiple biliary fistulae. Treatment of this uncommon complication of chronic cholecystitis consisted of cholecystectomy, takedown of the cutaneous fluid fistulae tract, and closure of the duodenal defect.

Spontaneous external biliary fistulae were well described in the medical literature prior to 1900. With the advent of modern biliary surgery, this complication of chronic cholecystitis has become a rarity.[1,2] We recently treated a patient who presented with a spontaneous cholecystocutaneous fistula, further complicated by a simultaneous cholecystoduodenal fistula. To our knowledge, this has not previously been described.

Report of a Case

A 67-year-old man was hospitalized after reporting five days of fevers and the presence of a tender right upper quadrant abdominal mass. The mass had spontaneously drained several hundred milliliters of serosanguineous fluid on the day prior to admission. The patient denied any abdominal trauma or gastrointestinal symptomatology. Forty years prior to admission, the patient had undergone a vagotomy and antrectomy for benign peptic ulcer disease. On examination, an 8 x 8 cm subcutaneous abscess in the right upper abdominal wall was noted. A well healed left paramedian abdominal incision was present. An evaluation for a possible enterocutaneous fistula was then carried out. No fitulous opening could be identified in the abscess cavity. An upper gastrointestinal series with small bowel follow-through demonstrated only postoperative changes consistent with a vagotomy and antrectomy. The defunctionalized limb of the Bilroth II anastomosis was not optimally visualized. A barium enema was entirely normal. Treatment consisted of incising and draining the abscess and placing the patient on Cefazolin 1 gm intravenously every six hours and Gentamycin 80 mg intravenously every eight hours. Cultures of the abscess subsequently grew out Klebsiella aerogenes and Escherichia coli. After completion of a course of antibiotics, the patient was discharged with a healing subcutaneous abscess. When seen in follow-up three weeks later, the wound was noted to be healing well, and no drainage was present. The patient was then lost to follow-up until six months later, at which time he presented with a five-month history of vague peri-umbilical discomfort, and increasing discharge from his abscess site. The abscess site had by this time contracted to form a small draining sinus. A sinogram was obtained (Figure 1). A diagnosis of cholelithiasis complicated by cholecystocutaneous and cholecystoduodenal fistulae was made. At the time of surgery a markedly thickened gallbladder with dense adhesions to adjacent bowel was encountered. The cholecystoduodenal fistula was identified at the site of perforation of the gallbladder by a 3.5 cm gallstone (Figure 2). The fistula was taken down, and the duodenal defect oversewn. The cholecystocutaneous fistula was seen to extend from the distal fundus of the gallbladder anterolaterally through the right posterior rectus sheath reaching the skin at the lateral margin of the rectus muscle. The tract was excised, and a cholecystectomy was performed. Microscopic

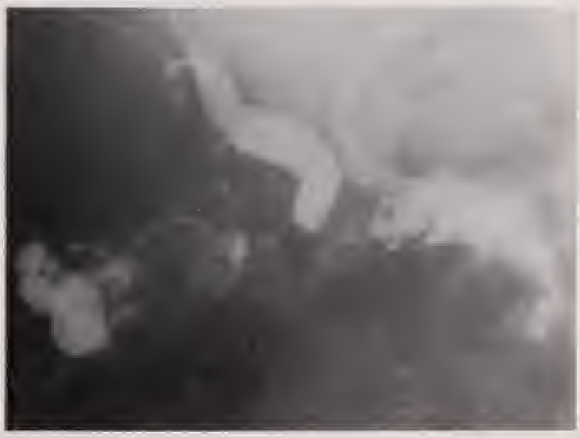

Fig.1 - Hypaque sinogram demonstrates cholecystocutaneous fistula with presence of a 3.5 cm gallstone within the gallbladder. Dye was seen to fill the duodenum through a cholecystoenteric fistula, followed by opacification of the cystic and common bile ducts.

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*Departments of Surgery, University of Minnesota (Dr. Tuna) and the Minneapolis Veterans Administration Medical Center (Drs. Maizel, O'Connor and Humphrey).

Reprints Requests: University of Minnesota Hospitals, 420 Delaware Street S.E., Box 347 Mayo, Minneapolis, Minnesota, 55455 (Dr. Tuna).

examination of the gallbladder revealed chronic cholecystitis with no evidence of malignancy. The patient did well postoperatively and was discharged approximately ten days after surgery.

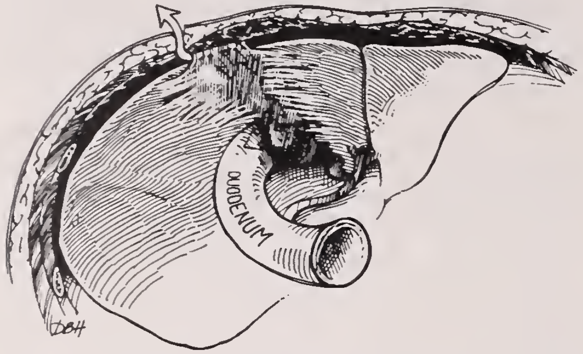

Fig. 2 - Diagram demonstrating the operative findings of chronic cholecystitis, cholecystocutaneous fistula and a cholecystoduodenal fistula at the site of a perforation of the gallbladder by a 3.5 gallstone.

Comment

External biliary fistulae were uncommon, but well recognized, complications of chronic cholecystitis prior to 1900. Thilesus in 1670 is generally credited with describing the first case of biliary-cutaneous fistula. Henry in 1948 reviewed the world's literature of 205 case reports and noted the extreme rarity of this condition following the acceptance of cholecystectomy for treatment of cholecystitis in the 1900s.[1,2]

Similarly, biliary-enteric fistulae have been well described, beginning with Bartholin's report in 1654. This uncommon complication of chronic cholecystitis is reported to be present in 0.5-1.8% of all patients undergoing biliary procedures.[3]

Multiple biliary fistulae are the rarest form of fistulous complications of cholecystitis, with only 24 cases reported. The majority of these consist of cholecystoduodenocolic fistulae.[4] Our patient presented with simultaneous cholecystocutaneous and cholecystoduodenal fistulae, a hitherto unreported occurrence.

Biliary fistulae typically occur in patients in their 60s, with a 3:1 female to male preponderance. Ninety percent of fistulae are associated with cholecystitis and cholelithiasis, while 10% are secondary to carcinoma of the gallbladder, abdominal trauma, or peptic ulcer disease.[1-3,5]

Cholecystocutaneous fistulae typically present in the right upper abdominal wall (47%) with the second most common location being peri-umbilical (25%). Escherichia coli and Klebsiella aerogenes have frequently been cultured from the fistulae, which may present as a large subcutaneous abscess.[1,2] A sinogram, if obtainable, is diagnostic. Treatment should consist of cholecystectomy with excision of the fistulous tract, particularly in view of a recent report of carcinoma occurring in association with a chronic biliary cutaneous fistula.[5]

The most common biliary enteric fistula is a cholecystoduodenal fistula (60%) with cholecystocolic fistula being the second most common form (20%). Of those with associated calculi, 15-20% will present with gallstone ileus. Barium enema, UGI series, and OCG may be diagnostic in 50-75% of patients. Treatment should consist of cholecystectomy and fistula takedown in those patients without bowel obstruction. Enterotomy with stone removal, followed by cholecystectomy and fistula takedown at a later date, has been advocated for those with bowel obstruction.[3] In our patient presenting with the most uncommon combination of both biliary-cutaneous and biliary-enteric fistula, treatment consisted of takedown of the cholecystoduodenal fistula, cholecystectomy, and excision of the cholecystocutaneous fistula tract.

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Letters to the Editor

Dear Editors:

I wish to applaud Dr. Raymond C. Bonnabeau, Jr.'s essay.[1] The significance of his statement should not be lost: "Although the Christian Church did inherit some aspects from Judaism, it was basically Hellenistic in origin." This eminently honest appraisal negates the frequently, thoughtlessly, and deceitfully used neologism: "Judeo-Christian Tradition." The more proper hyphenated term should obviously be "Hellenistic-Christian."

One more bit of trivia. How could the Arab Caliphate move to Baghdad in 749 when Baghdad was not founded until 763?[2]

The title of the paper should really be the "Islamic Connection" rather than the "Arab," because the Arabs did not become a political force until they adopted monotheism.

T. C. Papermaster, M.D.
Minneapolis, Minnesota

References

1. Bonnabeau, Raymond C, Jr.: Transfer of Greek Knowledge to the Western Civilization: The Arab Connection. Minnesota Medicine 68:381, May 1985.
2. Baron, Salo W: Social and Religious History of the Jews. Vol. 111, p99.

Dear Editors:

It was certainly gratifying to see that somebody read my historical article, but I was absolutely ecstatic to realize that somebody actually read it critically. In regards to the first point, concerning the Judeo-Christian tradition, I believe that this refers primarily to the religious historical event, and not so much to the Hellenistic culture that was grafted on to Christianity at a later date. In answer to the Arab Caliphate moving to Baghdad in 749, when in fact, Baghdad was not founded until 763, I can only say that in a small article, I did not really want to go into a great deal of detail on points such as this. In fact, the Abbasid Dynasty was founded in 749, with the Abbasid Ḳhalid living initially at al-Anbar, a town on the Euphrates. The second ruler of this line, al-Mansur, determined however, to find a new capitol. He then decided to build at a site of a town that was of considerable antiquity, even at the time. The town originally had been founded in Babylonian times, and was called Bag-Da-Du, a name whose origin is not known. In making his choice he was guided by the advice of his minister, the Persian Khalid ibn Barmak. He also used two astro logists to make sure things were propitious. It is interesting that one of the astrologists was Persian and the other was Jewish. The first stone of the new city, Baghdad built on Bag-Da-Du, was laid in the year 762, but it wasn't until three years later that the building was sufficiently advanced for the occupation to take place.

The title of the paper in terms of its being Arab or Islamic connection, I think, is a matter of choice. Arab of course, refers to a group of Nomadic people of Semitic origin that occupied the Arabian peninsula and environs. It is true that the Arabs did not become a political force, that is an Islamic force, until after Mohammed in the 7th century. They also obviously became a military force and conquered not only the Middle East, but North Africa, as well as Spain which all became critical at a later date. I think most authors have used the term Arab, but certainly I have seen others who have used the term Islamic as well in this context.

My own choice for the name Arab really lays in the fact that the transfer of knowledge started before the rise of Islam and the life and death of Mohammed. The rise of Islam was important, because later on this knowledge was transferred into Africa, but specifically into Spain. During the 11th and 12th century, Spain became the center from which this knowledge was re-translated back into Western Europe.

For general reading I could recommend *The Arabs-A Short History*, by Philip K. Hitti, and a very small, but definitive work by DeLacy O'Leary entitled *How Greek Science Passed to the Arabs*. Also a very recent book called, *Science in the Middle Ages*, edited by David C. Lindberg. Chapter two of that volume, written by Lindberg himself is entitled, *The Transmission of Greek and Arabic Learning to the West*, and goes into how the original Greek learning after going through Arabic finally came into Western Europe through the Spanish translators. This, of course, made a difference in Western Europe, because the onslaught of this new knowledge that became available was particularly important in the establishment of the universities. For this particular facet of history, I would recommend, Charles Homer Haskin's book called *The Renaissance of the Twelfth Century*. In this he explores the rise of the universities and how the newly translated Greek manuscripts influenced them.

Raymond C. Bonnabeau, Jr., M.D., Ph.D.
St. Paul, Minnesota

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Errata

In the December 1985 issue of MINNESOTA MEDICINE in the article on Lead Toxicity (French, Williams and Campbell, Page 899-901), the unit mg/dl was published in place of micrograms/deciliter. A line of text was omitted on page 900 under the section "For the Practicing Physician," the third sentence should read: "The practicing physician can expect concerned citizens, especially parents, to ask increasingly sophisticated questions about the effects and sources of lead."

Implementation and Transfer of Limited Treatment Orders from Long Term Care Facilities to Emergency Service Providers

The following was adopted as a position of the Minnesota Medical Association by the Board of Trustees on January 11, 1986.

I. *OVERVIEW*

It is widely recognized that in some situations, life-prolonging treatment may not be appropriate. Further, patients have the right to refuse medical therapies. The Minnesota Medical Association recognized these factors when they adopted Do Not Resuscitate Guidelines in 1981.

In the implementation of DNR orders, one of the concerns that has emerged relates to how emergency personnel called to a nursing home can know that DNR orders, or other orders limiting treatment, have been issued. Further, there should be a recognized means to transfer such orders from the nursing home to the hospital setting, via emergency service personnel. Verbal orders communicated by nursing home personnel are clearly insufficient, since failure to initiate cardiopulmonary resuscitation has life-threatening consequences. Transfer of written orders can be problematic, too, since the resident's chart must remain in the nursing home, and it may not be possible to reproduce the limited treatment order at the time of an emergency.

The purpose of this paper is to provide a framework for the implementation of limited treatment orders in the long-term care facility and to provide guidelines for how those orders can be transferred via emergency personnel to the hospital setting. The paper builds on the MMA's Do Not Resuscitate guidelines adopted in 1981, and provides a definition for Do Not Intubate.

II. *APPROVED DEFINITIONS*

The Minnesota Medical Association recognizes the following limited treatment orders:

DNR - Do Not Resuscitate - In the event of an acute cardiac or respiratory arrest, no cardiopulmonary resuscitative measures will be initiated.

DNI - Do Not Intubate - In the event of acute or impending respiratory failure, endotracheal intubation to provide sustained assisted ventilation should not be performed. (DNI does not prohibit emergency management to prevent or reverse acute airway obstruction with oral, nasal, or esophageal obturator airways or treatment of transient respiratory insufficiency with oxygen or short trials of assisted ventilation with positive pressure ventilation equipment or Ambu Bags.)

Other terms have been used to indicate limitations to treatment (e.g., supportive care, terminal care, conservative care). However, these terms are subject to varied interpretations and have no generally accepted definition in Minnesota at this time. Because these alternative terms are not clear, they cannot be honored by paramedics or other emergency service personnel. If the patient and/or family members (or other designated proxy) and the physician agree that treatment should be limited in some specific way other than what is represented by the terms DNR and DNI, the physician should note clearly in the patient's medical record the specific treatment or plan (e.g., no antibiotics, "do not call 911").

III. *IMPLEMENTATION OF LIMITED-TREATMENT ORDERS*

The Writing of the Order

1. The writing of a limited treatment order (DNR and DNI) should not be undertaken without full discussion of the diagnosis, prognosis, treatment options and implications. The attending physician should determine the appropriateness of considering limited-treatment orders for any given medical condition.
2. Both DNR and DNI orders are compatible with maximal therapeutic care. Persons may appropriately receive evaluation,assistance, treatment and hospital transport by the Emergency Care System. 911 may still be used to summon emergency assistance for such patients.
3. When the patient is competent, the limited treatment decision will be reached consensually between the patient and physician. When the patient is judged to be incompetent, this decision will be reached consensually by the appropriate family members (and/or designated proxy) and the physician. Limited treatment orders will not be written if a competent patient disagrees, or, in the case of incompetency, a member of the family (and/or designated proxy) disagrees. The nursing staff may also be asked to participate in this type of discussion.
4. If all relevant parties are in agreement with a DNR or DNI decision, the attending physician shall write this directive as a formal order in the patient's medical record. The patient's medical condition, other facts and considerations pertinent to the decision, and the related discussions with the patient and relevant others, should also be recorded by the attending physician in the progress notes. The physician may wish to use a form which has been adopted by the hospital or nursing home for recording this information.
5. The order should be signed and dated within the previous 12 months to be considered to be in effect. The limited treatment order should be subject to review on a regular basis and may be rescinded at any time by those originally involved in the discussion.

Implementation by Long-Term Care Facilities

6. Long-term care facilities are encouraged to adopt institutional guidelines to facilitate the appropriate implementation of DNR and DNI orders. This should include:
   - Accountability for proper decision-making principles and practices (including the principle of patient involvement in these decisions).
   - Documentation of the rationale for these directives in the medical record by the patient's physician.
   - Periodic review of these directives.
   - Adoption of readily identifiable transfer forms with DNR and/or DNI orders signed and dated by the attending physician.

Implementation by Emergency Medical Providers

7. Ambulance providers are encouraged to develop standard operating procedures that enable paramedics and emergency medical technicians to honor properly signed and dated DNR and DNI orders in the medical record.
8. Emergency department and hospital staff are encouraged to honor a valid

written DNR and/or DNI order. The order should accompany the patient during medical transport, and one of the following forms of documentation is recommended:

- An original copy of the medical order signed and dated by the patient's physician; or
- A patient transfer form signed and dated by the patient's physician; or
- A photocopy or carbon copy of such an order; or
- If none of the previous means is available for transferring the limited-treatment order, the paramedic may document on the Minnesota State Ambulance Form that he or she witnessed a properly signed and dated DNR or DNI order. The entry on the Ambulance Form should state: the specific order, the name of the physician, and the date of the signature. (For example, the run record might state: "A written DNR or DNI order was observed in the medical record signed on December 1, 1985, by John Doe, M.D.")

9. DNR, DNI and all limited treatment orders may be rescinded at any time. If, at the time of an emergency, the patient or a member of the family expresses a desire for treatment, the paramedics should initiate treatment regardless of the notations in the medical record. These orders can be re-evaluated with the patient and family when the physician is present.

This position paper was developed by the MMA Committee on Ethics and Medical Legal Affairs and the Emergency Medical Control and Protocols Committee. The leadership of Timothy J. Crimmins, M.D., is gratefully acknowledged.

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Control of Prehospital Care at the Scene of Emergencies

The following was adopted as a position paper of the Minnesota Medical Association by the Board of Trustees on November 2, 1985.

I. *OVERVIEW*

How should physicians and paramedics relate at the scene of a medical emergency? Who is in charge? How does the medical control physician who is in radio contact with the paramedics relate to the providers at the scene? The answers to these questions are dependent on a number of variables including: whether the physician on the scene is the patient's personal physician, who is the most qualified in providing emergency care, and whether the physician on the scene wishes to assume responsibility for the patient.

It is essential that these relationships be worked out quickly and smoothly, in the first minutes of the patient's care. Toward that end, this paper presents some background regarding the nature of prehospital emergency care systems and suggests guidelines for determining who is in charge at the scene of an emergency.

Prehospital emergency care systems operate under the authority and direction of a medical control physician — a licensed physician who is medically and legally responsible for patient care and the action of emergency personnel. The paramedics who arrive at the scene provide care according to protocols and specific directions of the medical control physician. When there is radio contact between the medical control physician and the paramedics, the term radio control physician or center is also used. When an advanced life support (ALS) unit is dispatched to an emergency, a doctor/patient relationship is established between the patient and the physician who provides medical direction for the ALS unit. Unless the patient's personal physician is present (as in a doctor's office or a house call), the paramedic is responsible for the management of the patient and acts as the agent of the medical director.

There are cases when a physician who has no previous relationship with the patient is present at the scene of an emergency. We have used the term "intervening physician" to describe this physician. Control of the care at the scene of a medical emergency should be the responsibility of the individual present who is most appropriately trained and knowledgeable in the provision of prehospital emergency treatment.

II. *GUIDELINES*

In situations where a physician is present at an emergency, several guidelines should apply in determining who should be in charge of managing the patient's care:

1. *If the patient's personal physician is present and wishes to assume responsibility for the patient's care, the paramedic should defer to the orders of the personal physician, and so inform the radio control physician.*

   The personal physician should verify orders by signing the EMS form as soon as time permits. The radio control physician should be contacted en route if indicated according to local operating procedures. The radio control physician may be contacted from the scene if indicated and the personal physician wishes. The paramedic's responsibility reverts back to the radio control physician (or standing orders per local protocol) at any time when the personal physician is no longer in attendance. However, regardless of whether the personal physician is present en route, the radio control physician should honor the wishes of the personal physician during the en route care of the patient, in a manner consistent with standards of patient care.

2. *An intervening physician not wishing to assume complete responsibility may elect to assist the paramedics and act as a medical consultant to them and to the radio control physician.*

3. *When no radio control exists and an intervening physician wishes to assume responsibility for the patient, the paramedics should relinquish responsibility for patient management.* The intervening physician must accompany the patient to the hospital. Physicians intervening at an emergency scene should avoid involvement in resuscitation measures that exceed their prior training and experience.

   The intervening physician should present identification that includes name, address, degrees, and state license number. He or she should sign appropriate forms assuming responsibility and verifying orders.

   The paramedics should present the physician with a statement regarding area policies and authority of paramedics and the medical control physician. This should include the role of the physician on the scene as developed by local participating physicians and medical societies.

   When these conditions exist, the paramedics should defer to the wishes of the physician on the scene. *If the treatment by that physician differs from that outlined by local protocol, the physician should agree in advance to accompany the patient to the hospital.* (In the event of a mass casualty incident, patient care needs may require the intervening physician to remain at the scene).

4. *In the case of multiple intervening physicians at the scene (as at an athletic event), the paramedics should request that the physicians designate one physician to direct the patient care. If the Medical Director of the paramedics or his or her designee is present at the scene, that physician should direct the patient care.*

5. *Except as noted in #1 (where the patient's personal physician is present), the radio control physician is ultimately responsible. If an intervening physician wishes to assume responsibility for the patient and radio control exists, the intervening physician must accompany the patient to the hospital. The paramedics shall contact the radio control center* as they normally would, and allow communication between the two physicians. The exchange of credentials should proceed as noted in #3 above.

   If there is any disagreement between the intervening physician and the local protocols or the radio control physician, the paramedics should follow the orders of the radio control physician and place the intervening physician in radio contact with the radio control physician.

   The radio control physician has the option of managing the case entirely, working with the intervening physician, or allowing the intervening physician to assume responsibility. In the event that the intervening physician assumes responsibility, all orders to the paramedics should be recorded on the ambulance form and signed by the physician, or repeated over the radio for purposes of recording.

These guidelines are consistent with guidelines adopted by the American College of Emergency Physicians (Annals of Emergency Medicine, July, 1984: 547-548) and the American Medical Association (Report X: A-84).

This paper was developed by the Emergency Medical Control and Protocols Committee. The leadership of Barbara C. LeTourneau, M.D., is gratefully acknowledged.

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* **WARNING**

> This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired.** If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened ORS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of Dyrenium (triamterene, SK&F CO.) and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function.

Thiazides may add to or potentiate the action of other antihypertensive drugs.

Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

Supplied: **'Dyazide' is supplied as a red and white capsule, in bottles of 1000 capsules; Single Unit Packages (unit-dose) of 100 (intended for institutional use only); in Patient-Pak™ unit-of-use bottles of 100.**

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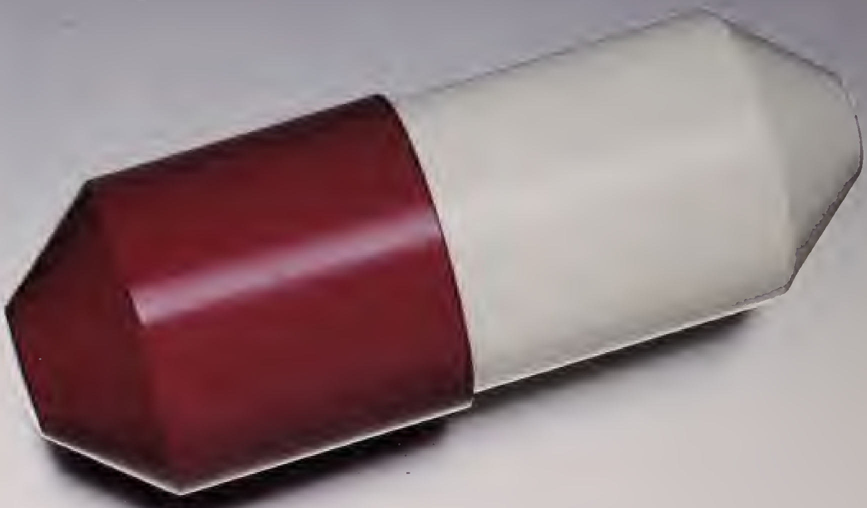

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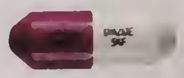

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A Bibliography of Edward Jenner by William LeFanu, 2nd ed. Winchester, England, St. Paul's Bibliographies, 1985, 160 pp., illus., (Limited Edition)

> Come, sweetest of the feather'd throng!
> And soothe me with thy plaintive song: . . .

These lines begin a poem entitled "Address to a Robin," by Edward Jenner (1749-1823). Although he has no claim to remembrance as a poet, the lines serve to illustrate something of the character and versatility of the man who began one of the world's greatest conquests of disease with the discovery, application, and popularization of vaccination. Jenner, the distinguished rural physician, had many interests and talents. In addition to poetry, he studied, wrote, and reported his observations in botany, ornithology, and natural history. In medicine, besides his enduring contribution to future viral research through the empirical development of smallpox vaccine, he made contributions on angina pectoris, ophthalmology, and valvular diseases of the heart. Jenner was a man of who it was said his friends and neighbors would accompany him 20 or 30 miles in a morning to enjoy his conversation. They would listen:

> "with the highest interest at one time to the overflowing of his mind, while with a vivid and imaginative fervour he shadowed forth his own feelings, or with a painter's eye and poet's tongue delineated the beauties around them. He would then descend to less impassioned themes, and explain, with the most capitivating simplicity and ingenuity, the economy of vegetables and animals, or the various productions that came within observation."

Millions of written and printed pages from out of our distant past to the present annotate the progress of medicine. A very small percentage of these hold the acknowledged classics—the foundation contributions—the seminal works (like that of Edward Jenner) which influence man and the world in which he lives. These have been awarded recognition, are reviewed, referenced, and often read. Little notice is taken of much of the remaining published efforts. These latter writings, while perhaps really only pertinent in their day and with little or no enduring value, still may mirror the spirit of the times. Most of these merit labels of being unqualified nonsense, absurd, worthless, poorly conceived and written, and should be quickly forgotten—if not irretrievably buried. Others, few in number, may be humorous, unusual, sometimes bizarre, interesting—even fascinating and stimulating; but deserve only a light "once over" for momentary reading entertainment. The book herewith being reviewed belongs to yet another category and that is bibliography, an area in which recognition for contributions often is neglected. This book is the work of William LeFanu, Librarian from 1930 to 1968 of the Royal College of Surgeons of England.

Subject to a plethora of definitions, which range from pure physical descriptions of books to evaluative classics, bibliography is not a consuming interest for most people. Nevertheless, it does offer much of value to those persons who desire to know "whence come and whence go" their science or art. LeFanu's scholarly contribution to bibliography, *A Bibliography of Edward Jenner*, will appeal to those persons in medicine who enjoy fireside communion with their history. W. G. Leland summed it up well in "Bibliography and Scholarship," published in *Inter-American Bibliography and Library Association Proceedings* 2:25-33, 1939, when he wrote, " . . . bibliography without scholarship is sterile, and scholarship without bibliography is impossible."

A Bibliography of Edward Jenner is pleasantly arranged, is utilitarian in design, has a readable format, seems free of editorial lapses, and has a good index. LeFanu in this (the second) edition has corrected errors and incorporated editions and articles which he missed (though none of major importance) in the 1951 first edition. Also, "he takes account of several notable additions to the list of publications by or about Jenner and discusses in detail the growth of Jenner's knowledge and the formation of his ideas, in the light of the research published over the last thirty-five years." This book will serve as a valued reference tool for librarians and for those who are interested in the histories of immunology and virology.

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11th - 12th	Colon & Rectal Diseases in Primary Care
14th - 15th	Annual Ophthalmology: Current Concepts in Refractive Surgery
17th - 20th	Migrant Health Conference
21st - 25th	Workshop on Fine Needle Aspiration Cytology
28th - May 2nd	Family Practice Review: Update 1986

MAY - JULY

May 7th - 9th	WorldMed '86: International Health Care Congress
7th - 9th	44th Annual Course in Allergy and Clinical Immunology
14th - 15th	Human Aging IX: Health Maintenance and Wellness
20th	Symposium on Gynecologic Oncology
21st - 23rd	Current Concepts in Radiation Therapy
30th - 31st	Adolescent Health Program: Gay Youth
June 4th	Options in Cardiovascular Medicine
6th - 7th	15th Annual Workshops on Clinical Hypnosis - Introductory and Advanced
6th - 8th	Surgery for Primary Care *(Presented in Brainerd, MN)*
13th - 14th	Hospital Nutrition Support
18th - 21st	50th Annual Surgery Course: Advances in Trauma and Critical Care Surgery
25th - 27th	Topics and Advances in Pediatrics
July 7th - 9th	Orthopaedic Surgery: Shoulder
24th - 25th	Symposium on Nuclear Medicine

SEPTEMBER - OCTOBER

Sept 8th - 12th	49th Annual Radiology Course: Gastrointestinal & Abdominal Interventional Radiology
*	Annual Trauma and Critical Care Seminar
26th - 27th	Adolescent Medicine Conference: High Risk Youth
Oct 1st - 3rd	Annual Internal Medicine Review
*	Geriatric Medicine
8th - 11th	Principles of Colon & Rectal Surgery
22nd - 24th	Obstetrics & Gynecology Annual Autumn Seminar
25th	E.T. Bell Pathology Symposium

**dates being determined*

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MMIE Malpractice Claim Review

General Surgery

MMIE RISK MANAGEMENT COMMITTEE;
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CHAIRMAN

Allegation

Negligently leaving a foreign object in a surgical site.

Facts of Case

On January 4, Dr. X., a general surgeon, performed a well-indicated gastric bypass with a Roux-en-Y gastrojejunostomy and Witzel gastrostomy on a 36-year-old female patient. The surgery was completed without apparent complications, and the final instrument and sponge counts were reported to be correct. Over the next two months, the patient was seen by both Dr. X and her family physician with what were considered to be minor complaints of right upper quadrant pain. Documentation of examinations by Dr. X on January 19 and February 16 indicated that the patient was doing well. Examination by the family physician on March 18, however, revealed a continuation of pain, hyperactive bowel sounds, and some diffuse tenderness throughout the abdomen and pelvis. A pelvic exam revealed a tender mass in the right adnexa. Abdominal ultrasound revealed an unexplainable ultrasonically complex structure in the area of abdominal tenderness.

On March 26, the family physician admitted the patient to the hospital. An IVP performed on that date revealed an elongated foreign body to the right of the spine, extending from the right suprapubic area to the level of T-12. The same day Dr. X performed a mini exploratory laparotomy and removed a malleable retractor. Dr. X recalled that during the bypass surgery, it had been necessary for the nurses to bring in an additional retractor which, presumably, was not added to the instrument count. Cultures for aerobic and anaerobic bacteria were taken, and drains were left along the inflammatory tract which had formed around the retractor. The abdominal cavity was not explored beyond the tract of the retained instrument. Although she had no overt signs of infection, the patient was started on antibiotic therapy and discharged April 9.

The patient was seen by Dr. X post-operatively on April 22 when it was recorded that she was "doing extremely well." Her post-operative course was also documented as essentially normal by her family physician until May 1 when the patient noted some foul smelling, thickened drainage from the wound. The patient was instructed to manipulate the wound twice daily to express any drainage and was started on a cephalosporin. She was next seen on May 8, complaining of abdominal cramping and nausea. Her blood pressure was 118/70, and the abdomen was tender with a scant amount of drainage from the wound. The family physician felt she was extremely anxious and administered 10 mg of Compazine IM. She was sent home with samples of Ativan and Combid. In the early morning of May 9, the patient expired at home.

Two autopsies indicated that the cause of death was septic shock due to severe peritonitis with multiple abdominal abscesses. A lawsuit was filed by the patient's husband and four children against Dr. X and the hospital. The family physician was not named in the suit.

Disposition

Structured settlement on behalf of Dr. X and the hospital with a guaranteed payout of $418,000.

Reasons for Settlement

Liability for the retained retractor was found under the legal doctrine of Res Ipsa Loquitur (the thing speaks for itself). Experts reviewing the case for the defense determined that the infectious process and ultimate death of the patient were directly related to the retained retractor. Expert reviewers were also critical of the apparent failure to recognize the possibility of infection around the retractor and take appropriate steps, including cultures and surgical exploration to treat the infectious process.

Risk Management Comment

A common allegation against surgeons is negligently leaving sponges and surgical instruments in operative sites. The doctrine of Res Ipsa Loquitur often makes these cases indefensible. Frequently, the claims also include allegations of failure to diagnose the retained object when symptoms occur. If the foreign object is diagnosed immediately after surgery, usually the damages award is minimal. If the object is not diagnosed until sometime following the original hospitalization, the damage award may rise significantly because of the patient's additional pain and suffering, medical expenses relating to a second hospitalization and additional surgery, and lost wages during the recuperative period.

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

FEBRUARY, 1986

22 **Current Issues in Occupational Medicine** Naeve Hospital (Albert Lea) and St. Olaf Hospital (Austin); Albert Lea Inn, Albert Lea, Minnesota. CONTACT: Jon K. Wogensen, M.D., Naeve Hospital, Albert Lea, Minnesota 56007, 507/373-5180.

24-28 **Internal Medicine Meeting - Endocrinology/Nephrology/Hypertension** Mayo Clinic/Mayo Foundation; Hilton Beach and Tennis Club, San Diego, California. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

25-28 **Critical Care Management of Medical, Obstetrical and Surgical Patients** University of Minnesota Hospitals and Clinics; Grenelefe Golf and Tennis Resort, Grenelefe, Florida. CONTACT: Lisa McDonald, University of Minnesota Hospitals and Clinics, Box 200 Mayo, 420 Delaware St. SE, Minneapolis, Minnesota 55455. 612/376-7317

26-27 **Drug Therapy Symposium VII** Office of CME, University of Minnesota; Radisson Hotel, St. Paul; CONTACT: Office of CME, University of Minnesota, Box 293 Mayo, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

MARCH, 1986

1-8 **Current Concepts in Medicine** St. John's Hospital; Manor Vail, Vail, Colorado. CONTACT: Diane Truex, 2696 Hazelwood Avenue, Maplewood, Minnesota 55109. 612/779-4535.

3-7 **Current Perspectives in Critical Care Medicine** Mayo Clinic/Mayo Foundation; Turtle Bay Hilton Country Club, Oahu, HI. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

5-8 **Fourth Annual Critical Care Conference** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

8-12 **Electrodiagnosis of Neurologic Diseases** Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota 55905. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55901. 507/284-2085.

10-12 **Bone & Soft Tissue Tumors** Mayo Clinic/Mayo Foundation; Del Coronado Hotel, San Diego, CA; CONTACT: William L. Nietz, Mayo Clinic 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

15-22 **Symposium on Health Care for the Elderly**; Minnesota Medical Association; Kauai Hilton, Kauai, HI. CONTACT: Eugenia C. Kassar, MMA, 2221 University Ave. S.E. - Suite 400, Minneapolis, MN 55414. 612/378-1875.

17-19 **Urology Update** Mayo Clinic/Mayo Foundation; Sawgrasss Resort, Ponte Vedra Beach, FL. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

21-22 **Borderline Syndrome in Children** Abbott Northwestern Hospital; Hyatt Regency, Minneapolis. CONTACT: Sarah Ventres, CME Coord., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461

21-22 **Seventh Annual Update:** Occupational Medicine. St. Paul-Ramsey Medical Center; Holiday Inn-Town Square. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

26 **Hypertension Symposium** CME, Medical School, University of Minnesota; 2-690 Moos Tower, University of Minnesota, Minneapolis. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373/8012.

APRIL, 1986

4 **Duluth Heart Conference** The Duluth Clinic, Ltd.; Fitger "Spirit of the North" Theater, Duluth; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

4-5 **Eye Enucleation** CME, Medical School, University of Minnesota; 2-155 Jackson Hall, University of Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota. 55455. 612/373/8012.

5 **Symposium on the Dementias-Pathology** Minnesota Society of Clinical Pathologists; Radisson Metrodome, Minneapolis. CONTACT: Pam Lindberg, MSCP, 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

5 **Minnesota Society of Anesthesiologists Spring Scientific Meeting** Minnesota Society of Anesthesiologists; Marriott, Bloomington, Minnesota. CONTACT: Peter A. Southorn, MBBS, 200 First Street Southwest, Rochester, Minnesota 55905. 507/286-8766.

10-11 **Gynecology Update** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

11-12 **9th Annual Update in Practical Cardiology** Abbott Northwestern Hospital, Abbott Northwestern Hospital. CONTACT: Sarah Ventres, Ed. Dept., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-4300.

(April continued)

11-12 Colon and Rectal Diseases in Primary Care CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 Current Concepts in Refractive Surgery CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis; CONTACT: Office of CME, University of Minnesota, Box 293 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/373-8012.

17-20 Migrant Health Conference CME, Medical School, University of Minnesota; Amfac Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

18 ENT Update St. Joseph's Hospital; 69 West Exchange Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

22-26 Workshop on Fine Needle Aspiration Cytology CME, Medical School; E.T. Bell Institute, 2-116 Moos Tower, University of Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

24-25 Pediatric Days Mayo Clinic/Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayio Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

24-25 Detection and Diagnosis of Substance Abuse in Patients St. Paul-Ramsey Medical Center; Wilder Forest, Stillwater, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

25 Clinical Oncology for Primary Care Physician St. Joseph's Hospital; Scheffer Auditorium, 69 West Exchange Street, St. Paul, Minnesota. CONTACT: James Giefer, M.D., St. Joseph's Hospital, 69 West Exchange Street, St. Paul, Minnesota 55101. 612/291-3100.

25-26 Adolescent Health Program: Gay Youth Office of CME, University of Minnesota (to be announced). CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

26 Problems in Acute Pediatric Care The Duluth Clinic, Ltd.; The Duluth Clinic, Ltd., 400 E. Third Street, Duluth, Minnesota 55805. 218/722-8364.

April 28-May 2 Practice of Internal Medicine Mayo Clinic, Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

April 30-May 2 133rd Annual Meeting & Scientific Program Minnesota Medical Association; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Eugenia C. Kassar, Director, Department of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

MAY, 1986

2-3 Genetics Counseling for the Primary Care Physician Abbott Northwestern Hospital; Registry Hotel, Bloomington. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

7-9 World Med 1986: International Health Care Congress CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

7-9 44th Annual Course in Allergy and Clinical Immunology CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 Human Aging IX: Health Maintenance and Wellness; CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

15 Changing Profiles in Clinical Toxicology. St. Paul-Ramsey Medical Center, Hennepin County Medical Center, Minneapolis. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

20 Symposium on Gynecologic Oncology CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21-23 Current Concepts in Radiation Therapy CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

JUNE, 1986

4 Option in Cardiovascular Medicine CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-7 15th Annual Workshops on Clinical Hypnosis-Introductory & Advanced CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota 55455. 612/373-8012.

July 31-August 2, 1986 Third Annual St. Paul-Ramsey Trauma Conference; St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, WI: CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3980.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

Minnesota Physician's Directory

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Family Practice Review: Update 1986
April 28- May 2, 1986
CME, Medical School, University of Minnesota

Place: Radisson St. Paul Hotel, 11 E. Kellogg Blvd., St. Paul, Minnesota
Contact: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast,
Minneapolis, Minnesota 55455
Telephone: (612) 373-8012

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Classified advertising rates are forty (40) cents a word; minimum monthly charge $10.00, key number, $2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

OPHTHALMOLOGIST, Cardiologist/Internist Specialty positions available with Mankato Clinic, Ltd. Excellent group practice opportunity in All-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R.F. Roskens, Administrator or B.C. McGregor, M.D. (507) 625-1811.

NEED MONEY? Eight family physicians and two primary care specialists needed over next four years, in rural Minnesota. Will consider you now. Educational funds and early sign up bonuses. We are not an agency!! Send name and brief resume to: Minnesota Medicine (765), 2221 University Avenue SE., Suite 400, Minneapolis, MN 55414.

UROLOGIST WANTED Board Certified-Board Eligible Urologist needed to join a well established downtown practice in Minneapolis. Send cirriculum vitae to: Minnesota Medicine (768) 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414.

FAMILY PRACTITIONER for Mankato Clinic satellite office. Excellent group practice opportunity in all-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R. F. Roskens, Administrator or B. C. McGregor, M.D. (507) 625-1811.

SUBURBAN MINNEAPOLIS PEDIATRIC Practice desires full time pediatrician (board certified or eligible) to start April, 1986. Subspecialty interest in allergy or adolescent medicine helpful but not required. Busy diverse practice with good financial package. Contact: Gene Inett, Administrator, Metropolitan Pediatric Specialists, P.A.; 416 Southdale Medical Building; Edina, Minnesota 55435. (612) 920-9191.

GENERAL SURGEON, OB/GYN and Internal Medicine Board Certified or Eligible, to join eight doctor clinic in Cloquet, Minnesota, a community of 12,000 (30,000 service area) located 20 minutes from Duluth-Superior. Clinic facility is located one block from modern, well equipped hospital. Cloquet enjoys a stable economy (forest products). Additionally, our community is noted for its excellent school system. First year salary guaranteed, paid malpractice, health and disability insurance, vacation and study time. Contact John Turonie, Administrator, Raiter Clinic, Ltd., 417 Skyline Boulevard, Cloquet, Minnesota 55720. Telephone (218) 879-1271.

PEDIATRICS AND FAMILY PRACTICE positions available with our clinic. We offer OB/Gyn, surgical and family practice specialists within our group. Located at the western tip of Lake Superior in northlands of Wisconsin, Superior offers an abundance of recreational activities — skiing, sailing, hunting — excellent education system and cultural activities. Send C/V to: Chairman, Recruitment Committee, 3500 Tower Avenue, Superior, Wisconsin 54880.

FAMILY PHYSICIAN - Join a progressive medical community in providing medical services to the Sebeka community in central Minnesota. Beautiful area, great community for raising family. Details, contact James G. Lawson, Administrator, Tri-County Hospital, Wadena, MN 56482, (218) 631-3510.

SUBURBAN F.P. GROUP - SHARE affiliate - seeks associate to service rapid practice growth - competitive salary and benefits - unique opportunity to establish your practice - contact Gloria M. Vierling, Sundance Medical Clinics, LTD., 323 Naumkeag St., P.O. Box 9, Shakopee, MN 55379, (612) 445-6440.

(continued on page 101)

BALANCED CALCIUM CHANNEL BLOCKADE!

CARDIZEM
(diltiazem HCl)
balances potent coronary vasodilation with a low incidence of side effects

Low incidence of side effects
CARDIZEM® (diltiazem HCl) produces an incidence of adverse reactions not greater than that reported with placebo therapy, thus contributing to the patient's sense of well-being.

*Cardizem is indicated in the treatment of angina pectoris due to coronary artery spasm and in the management of chronic stable angina (classic effort-associated angina) in patients who cannot tolerate therapy with beta-blockers and/or nitrates or who remain symptomatic despite adequate doses of these agents.

References:

1. Strauss WE, McIntyre KM, Parisi AF, et al: Safety and efficacy of diltiazem hydrochloride for the treatment of stable angina pectoris: Report of a cooperative clinical trial. Am J Cardiol 49:560-566, 1982.
2. Pool PE, Seagren SC, Bonanno JA, et al: The treatment of exercise-inducible chronic stable angina with diltiazem: Effect on treadmill exercise. Chest 78 (July suppl):234-238, 1980.

Reduces angina attack frequency*
42% to 46% decrease reported in multicenter study.[1]

Increases exercise tolerance*
In Bruce exercise test,[2] control patients averaged 8.0 minutes to onset of pain; Cardizem patients averaged 9.8 minutes ($P<.005$).

CARDIZEM®
(diltiazem HCl)

THE BALANCED CALCIUM CHANNEL BLOCKER

Please see full prescribing information on following page.

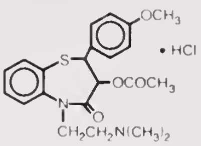
2/84

PROFESSIONAL USE INFORMATION

cardizem®
(diltiazem HCl)
30 mg and 60 mg tablets

DESCRIPTION

CARDIZEM® (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist). Chemically, diltiazem hydrochloride is 1,5-Benzothiazepin-4(5H)one,3-(acetyloxy)-5-[2-(dimethylamino)ethyl]-2,3-dihydro-2-(4-methoxyphenyl)-, monohydrochloride,(+)-cis- The chemical structure is:



Diltiazem hydrochloride is a white to off-white crystalline powder with a bitter taste It is soluble in water, methanol, and chloroform. It has a molecular weight of 450.98. Each tablet of CARDIZEM contains either 30 mg or 60 mg diltiazem hydrochloride for oral administration.

CLINICAL PHARMACOLOGY

The therapeutic benefits achieved with CARDIZEM are believed to be related to its ability to inhibit the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle.

Mechanisms of Action. Although precise mechanisms of its antianginal actions are still being delineated, CARDIZEM is believed to act in the following ways:

1. Angina Due to Coronary Artery Spasm: CARDIZEM has been shown to be a potent dilator of coronary arteries both epicardial and subendocardial. Spontaneous and ergonovine-induced coronary artery spasm are inhibited by CARDIZEM.
2. Exertional Angina: CARDIZEM has been shown to produce increases in exercise tolerance, probably due to its ability to reduce myocardial oxygen demand This is accomplished via reductions in heart rate and systemic blood pressure at submaximal and maximal exercise work loads

In animal models, diltiazem interferes with the slow inward (depolarizing) current in excitable tissue It causes excitation-contraction uncoupling in various myocardial tissues without changes in the configuration of the action potential. Diltiazem produces relaxation of coronary vascular smooth muscle and dilation of both large and small coronary arteries at drug levels which cause little or no negative inotropic effect. The resultant increases in coronary blood flow (epicardial and subendocardial) occur in ischemic and nonischemic models and are accompanied by dose-dependent decreases in systemic blood pressure and decreases in peripheral resistance

Hemodynamic and Electrophysiologic Effects. Like other calcium antagonists, diltiazem decreases sinoatrial and atrioventricular conduction in isolated tissues and has a negative inotropic effect in isolated preparations. In the intact animal, prolongation of the AH interval can be seen at higher doses

In man, diltiazem prevents spontaneous and ergonovine-provoked coronary artery spasm It causes a decrease in peripheral vascular resistance and a modest fall in blood pressure and, in exercise tolerance studies in patients with ischemic heart disease, reduces the heart rate-blood pressure product for any given work load. Studies to date, primarily in patients with good ventricular function, have not revealed evidence of a negative inotropic effect, cardiac output, ejection fraction, and left ventricular end diastolic pressure have not been affected There are as yet few data on the interaction of diltiazem and beta-blockers Resting heart rate is usually unchanged or slightly reduced by diltiazem.

Intravenous diltiazem in doses of 20 mg prolongs AH conduction time and AV node functional and effective refractory periods approximately 20%. In a study involving single oral doses of 300 mg of CARDIZEM in six normal volunteers, the average maximum PR prolongation was 14% with no instances of greater than first-degree AV block Diltiazem-associated prolongation of the AH interval is not more pronounced in patients with first-degree heart block In patients with sick sinus syndrome, diltiazem significantly prolongs sinus cycle length (up to 50% in some cases).

Chronic oral administration of CARDIZEM in doses of up to 240 mg/day has resulted in small increases in PR interval, but has not usually produced abnormal prolongation. There were, however, three instances of second-degree AV block and one instance of third-degree AV block in a group of 959 chronically treated patients

Pharmacokinetics and Metabolism. Diltiazem is absorbed from the tablet formulation to about 80% of a reference capsule and is subject to an extensive first-pass effect, giving an absolute bioavailability (compared to intravenous dosing) of about 40%. CARDIZEM undergoes extensive hepatic metabolism in which 2% to 4% of the unchanged drug appears in the urine. In vitro binding studies show CARDIZEM is 70% to 80% bound to plasma proteins Competitive ligand binding studies have also shown CARDIZEM binding is not altered by therapeutic concentrations of digoxin, hydrochlorothiazide, phenylbutazone, propranolol, salicylic acid, or warfarin. Single oral doses of 30 to 120 mg of CARDIZEM result in detectable plasma levels within 30 to 60 minutes and peak plasma levels two to three hours after drug administration. The plasma elimination half-life following single or multiple drug administration is approximately 3.5 hours. Desacetyl diltiazem is also present in the plasma at levels of 10% to 20% of the parent drug and is 25% to 50% as potent a coronary vasodilator as diltiazem. Therapeutic blood levels of CARDIZEM appear to be in the range of 50 to 200 ng/ml There is a departure from dose-linearity when single doses above 60 mg are given, a 120-mg dose gave blood levels three times that of the 60-mg dose. There is no information about the effect of renal or hepatic impairment on excretion or metabolism of diltiazem.

INDICATIONS AND USAGE

1. **Angina Pectoris Due to Coronary Artery Spasm.** CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks).
2. **Chronic Stable Angina (Classic Effort-Associated Angina).** CARDIZEM is indicated in the management of chronic stable angina CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance.

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic)

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0 48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited Caution should be exercised when using the drug in such patients.
3. **Hypotension.** Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension
4. **Acute Hepatic Injury.** In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes. (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS).

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%), AV block (1.1%). In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence.

Cardiovascular:	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope.
Nervous System:	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia
Gastrointestinal:	Constipation, dyspepsia, diarrhea, vomiting, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH
Dermatologic:	Pruritus, petechiae, urticaria, photosensitivity.
Other:	Polyuria, nocturia.

The following additional experiences have been noted.

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: erythema multiforme; leukopenia; and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established.

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited. Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers. In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage. The following measures may be considered

Bradycardia	Administer atropine (0.60 to 1.0 mg) If there is no response to vagal blockade, administer isoproterenol cautiously
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg, dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral/LD_{50}'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively The intravenous LD_{50}'s in these species were 60 and 38 mg/kg, respectively. The oral LD_{50} in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity.

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Orthopedic Surgeon Practice opportunity available for Orthopedic Surgeon in association with two Board Certified General Surgeons in Northwest Iowa. Modern, expanding hospital facilities in growth-oriented communities. Excellent financial and benefit package. Contact: J. Dwight Gray, Administrator, Floyd Valley Hospital, LeMars, Iowa (712) 546-7871.

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Physician Wanted Five-man Family Practice Group in Anoka, Minnesota in immediate need of a Family Practice Physician. SHARE and PHP affiliation. Compensation package and salary competitive. Contact: Michael Otto, M.D., 850 E. Main Street, Anoka, Minnesota 55303. (612) 421-7070.

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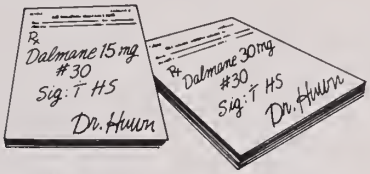
References: **1.** Kales J, *et al: Clin Pharmacol Ther 12*:691-697, Jul-Aug 1971. **2.** Kales A, *et al: Clin Pharmacol Ther 18*:356-363, Sep 1975 **3.** Kales A, *et al: Clin Pharmacol Ther 19*:576-583, May 1976. **4.** Kales A, *et al: Clin Pharmacol Ther 32*:781-788, Dec 1982. **5.** Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc 27*:541-546, Dec 1979 **6.** Dement WC, *et al: Behav Med*, pp. 25-31, Oct 1978 **7.** Kales A, Kales JD: *J Clin Psychopharmacol 3*:140-150, Apr 1983. **8.** Tennant FS, *et al:* Symposium on the Treatment of Sleep Disorders, Teleconference, Oct 16, 1984 **9.** Greenblatt DJ, Allen MD, Shader RI: *Clin Pharmacol Ther 21*:355-361, Mar 1977.



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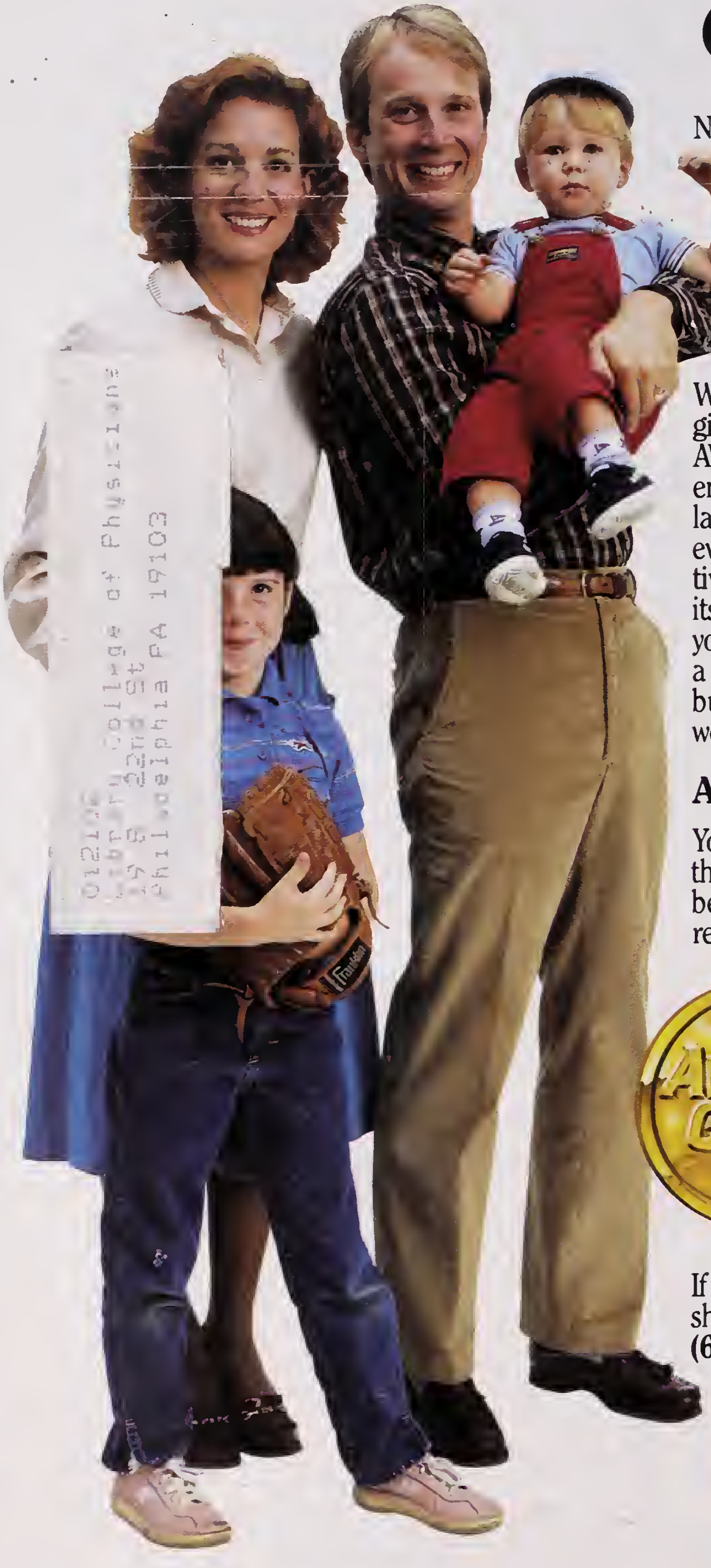

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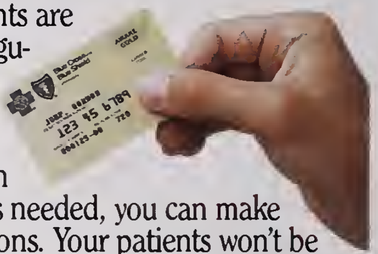

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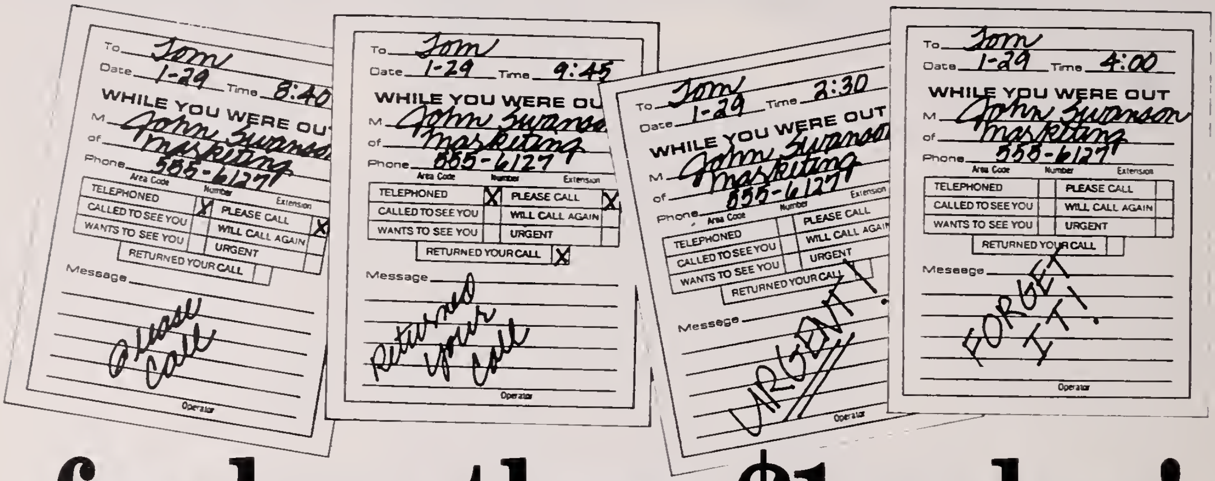
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President's Letter

Risk Management—Good Patient Care

Peggy Craig

M. Elizabeth Craig, M.D.
President
Minnesota Medical Association

The medical profession and the public have been very interested in the report of the Minnesota Commission on Professional Liability and the resulting tort reform bill before the 1986 State Legislature.

Tort reform is an important factor in resolving the emerging professional liability crisis we face in Minnesota. The Commission report, however, addresses other factors which are as important—possibly more important than tort reform—to resolve the crisis before us.

These factors are:

1. Increasing trend to file lawsuits; the "litigious society" syndrome
2. Unrealistic public expectations; the "Marcus Welby" syndrome
3. Failure of physicians to adhere to established medical standards.

I would like to address the last factor and its relationship to professional liability. And to address it, we must discuss "risk management."

According to its 1984 annual report, thirteen cases filed with our captive insurance company (MMIE) were each settled for $50,000 or more for a total of almost 2.4 million dollars. This exceeded 80 percent of the monies paid out by MMIE for claims in 1984. The insurance company promptly and appropriately responded to these cases in which there was obvious malpractice. Physicians had deviated from well-established practice patterns.

Physicians tend to think of risk management as the processes to protect themselves from suits brought for whatever reason. The insurance companies necessarily must talk about claims prevention and impact on premium dollars. Physicians must begin to define risk management as good patient care and do all in their power to adhere to the high level of care we have established in this state. This is a litigious society, and physicians must protect themselves from nonmeritorious attacks. This protection, however, is best achieved by practicing medicine to provide good patient care.

We cannot complain of what others are doing to us until we focus on and document what we ourselves are doing in the interest of providing the best possible care for our patients and in preventing injury to them.

For physicians, risk management should not be thought of as defensive actions, not as mechanisms to prevent claims, not as exercises to satisfy our insurance companies, but as concern for patient care and prevention of injury.

For example, risk management failures which cause patient injury include:

Poor documentation and communication between health care providers: How can your colleague or consultant who sees your patient know your therapeutic plan, history, or pertinent facts about your patient without adequate and legible documentation of your knowledge and treatment plans?

Law office systems: An x-ray or laboratory report filed or reported to a patient without being seen by the physician may irreparably affect the patient's welfare. This is common failure.

Phone Triage by an untrained receptionist: A person's inability to evaluate subtle symptoms which are then labeled as "flu" could be a life threatening case of meningitis or a heart attack diagnosed as stomach pain or muscle strain.

Typographical or dictation errors not proofread or corrected: A wrong labeling or misstatement can result in a wrong limb or organ being prepped and operated upon.

Not identifying a primary care physician:

Seeing a different physician at each office visit precludes continuity of care and possibly less than acceptable outcome of treatment such as a breast lump not appropriately followed and evaluated until it presents a very serious prognosis.

Poor or inadequate doctor-patient communication: The patient must understand completely the nature of his or her illness or injury and what responsibility he or she has in dealing with it. This includes well-documented informed consent.

In my 1500 miles of travel across the state talking with the public media, I have frequently been asked by my colleagues: "Why do you say there is malpractice?" My answer is that there *is* malpractice. To not acknowledge it is to lose our credibility.

There will always be malpractice suits and there will always be malpractice because physicians, as people, will make mistakes and predictable outcomes of treatment are impossible. We can lessen the possibility of suit by addressing our responsibility to the patient and to his or her treatment by providing the best possible level of care. *This* is risk management, and it equates with good patient care.

Cover Photograph

"Red Boat on the Bay"

"Mt. Baker in the background, the fishing net, and the weather-beaten red boat provided the basic elements for the cover photograph," Dr. Kandiko told the editors. The photograph was taken in Bellingham, Washington, with a Nikon FM 28 mm. lens at f22.

Doctor Kandiko is a family practitioner who lives in Chaska, Minnesota, and practices at the Crossroads Medical Centers in Chaska and Prior Lake. He had a previous cover on the May, 1984 issue of MINNESOTA MEDICINE.

Editor's Notebook

Corporate Transformation of Medicine in Minnesota The View from Eagan:

An Interview with Minnesota Blue Cross-Blue Shield Officials

Seventeenth in a Series

> *"In the past, HMOs have used their cost efficiency to fuel their appetites for expansion rather than to reduce premiums, which have hovered near those charged by the fee-for-service insurers. This presented an opening to Blue Cross-Blue Shield in recruiting state workers with its new comprehensive-care plan. In 1985, the state, for the first time, sought closed bids from insurers and set its premium contribution at the level of the lowest bid. AWARE Gold underbid the HMOs, as a result offering potential enrollees comprehensive care, choice of providers, and low cost."*
>
> Ronni L. Scheier, "HMO enrollment drops in Twin Cities for first time," *American Medical News*, January 10, 1986.

Eagan, Minnesota - You can't beat the view from President Andrew P. Czajkowski's office. Through his fifth floor office windows at the Blue Cross-Blue Shield building, you can see downtown Minneapolis and St. Paul with equal clarity.

The View and the Climate

This clarity of view does not extend to the Minnesota health care scene. Each day, the Minnesota health care climate grows more cloudy, turbulent, unpredictable and stormy.

This Week's Events

Take this week. As I write, Group Health and SHARE are swapping ads, exchanging promises of comprehensive benefits for senior citizens, to be had for $9.95 a month; Leonard Schaeffer, President of Group Health, formerly the quintessential staff model HMO, has resigned to become head of Blue Cross of California, one of the largest of the indemnity prepaid health plans; MedCenters is reorganizing internally, is going head-to-head with the Blues in outstate Minnesota by signing up multispecialty clinics to exclusive contracts, is saying it is negotiating with Health Care Corporation of America, a giant for-profit corporation that may acquire it; and Physicians Health Plan officials are scurrying around the Twin Cities, attending meetings with lawyers, hospital administrators, and physicians, trying to dampen or put out political firestorms the plan ignited by announcing its "hit list," "short list," or "select list," whichever you prefer, of hospitals where members of its low-cost seniors' plan can go.

Clarity of Vision

These events do not surprise Czajkowski and his staff. They believe the events may stem from the success of AWARE Gold. This Blues' plan, which gained over 140,000 members in one year, may have upset the delicate equilibrium of the market and triggered realignment of the system.

Resurfacing Opportunities

As Czajkowski sees it, the Blues have opportunities to resurface as the largest and fastest growing market force in the Twin Cities' health care market. To him and his team, reasons for this re-emergence are self-evident: (1) multiple new products, particularly *AWARE Gold* and its derivatives, that cover every niche in the market; (2) competitive prices that meet or undercut HMO competition; (3) a diffuse network of 5,800 physicians within the state and the entire Blues' system outside of Minnesota that offer wide access for patients, physicians, and hospitals; (3) 100 percent coverage for services within the system and 80 percent coverage with a deductible outside the system; (4) *true* freedom of choice for hospitals and physicians; (5) newly introduced *MEDISGRPS* computer system that will match physician performance and productivity against illness severity; and (6) the marketing team, computer support, cost containment systems, and other services that assure the Blues will deliver on their promises and compete economically.

This litany of virtues smacks of a Blue Cross-Blue Shield commercial. But given the Blues' recent track record of a $7 million surplus in 1985 and its increasing enrollment in the toughest health care market in the United States, I thought it would be worthwhile interviewing Czajkowski and his management team.

Czajkowski is President and Chief Executive Officer of Minnesota Blue Cross and Blue Shield. He is a calm, trim, slightly built man in his early fifties. He exudes an air of calm confidence. He stepped into his current position three years ago, after the Blues lost $26 million the previous year. Czajkowski is no neophyte to Minnesota health care wars, having worked for the Blues for 20 years. His experience in the unique Minnesota market has been valuable. In most parts of the country, Blue Cross and Blue Shield plans dominate 50 to 80 percent of the market. In Minnesota, the Blues have had a smaller market share.

Major Blues' Moves

Now, because of major moves over the last three years, AWARE contracts with hospitals and physicians, tighter preadmission and utilization controls, strengthening and refining of computer systems, expanding and focusing of market strategies, the introducing of multiple new insurance and health care products, the beefing up of HMO Minnesota and the acquiring of Coordinated Health Care, the effectiveness of AWARE Gold marketing and its linking with other products, and the newly implemented *MEDISGRPS* hospital computer program, which will track physician performance data against severity adjusted disease among Minnesota hospital patients - the Blues are staging a comeback calculated to win back market share and to give Minnesota patients and physicians more options in a system of contracting choices.

Perceived Problems

Not everybody agrees with the Blues' assessment of their future. Skeptics say no open access system can ever be truly competitive. Minnesota Blue Cross and Blue Shield has three perceived problems. These are: (1) it does not have tight enough cost-controls for its providers - physicians, dentists, chiropractors, pharmacists and hospitals - to be profitable over the long run in an intensely competitive market; (2) it does not have enough marketing savvy to bring patients flocking through doctors' doors; and (3) it is not close enough to its physician providers to persuade them the Blues represent a growing, significant, and legitimate force in the new Minnesota health care marketplace.

The Perception of Legitimacy

The perception of legitimacy among physicians and hospitals is paramount. This legitimacy is linked to a sense of fairness and a sense of evenhandedness, two traits HMOs often lose when they pursue exclusive or favored arrangements.

EDITOR'S NOTEBOOK

Switching and Choosing

Patients are switching from one health plan to another in record numbers, somewhere in the range of 25 to 30 percent each year. This turnover in plan members is a recent phenomenon and may be related to the discounted market with narrowing of price differences between plans and the widening of the plan options. In any event, patients are confused as to the claims of each plan. Increasingly, patients are asking physicians' advice as to which plan to choose. As marketing and price wars escalate, patients will be besieged by promises of lower prices with wider benefits, and they will turn to physicians to help them sort out their options.

A Little Help

To help you, the physicians of Minnesota, become better informed about merits of these options and underlying marketing and cost-containment strategies, I have decided to interview those responsible for the various health plans.

I am starting with Blue Cross and Blue Shield officials because their plan represents the oldest plan and because the Blues have a state-wide distribution and, therefore, a central role in the rapidly emerging multiple option health care market.

I conducted this interview in the office of Andrew Czajkowski, President. Others present were Phillip Little, Senior Vice-President of Government Programs and Chief Executive Officer of MII Life; Harvey Hopkins, Senior Vice-President, Finance and Provider Relations; Mary Brainerd, Vice-President and Chief Operating Officer of HMO Minnesota, and Ann Gjelten, Vice-President of Marketing.

REECE: I shall start with what's on everybody's mind. How do you view PHP's decision to limit its hospital affiliations?

CZAJKOWSKI: This action indicates heightened price competition in consumer markets. It demonstrates hospitals are interested in making favorable prices available when the hospital directly gains market share. PHP obviously feels limited hospital affiliation is the best strategy to get the consumer prices they need.

REECE: So what? It's a competitive market, isn't it?

CZAJKOWSKI: The greatest concern about the PHP approach is that it stands in opposition to the "freedom of choice" niche PHP proclaimed to fill. In this particular situation, neither the patients nor the physicians has true freedom of choice in the PHP system.

REECE: What if senior citizens want a choice outside the PHP system?

CZAJKOWSKI: Blue Cross and Blue Shield has just announced a new program called SENIOR Gold to compete with the PHP Senior Plan. We are committed to offering all providers an opportunity to participate in the plan. This opportunity will be well received, we believe, by patients, physicians, and hospitals. We will fill the niche PHP seems to be abandoning. This is true of all our offerings since we give the opportunity to participate to all.

REECE: But what will this action to compete with PHP for seniors mean in the long run? Can you stay competitive with open access to all hospitals?

CZAJKOWSKI: We think so. The volume is there, and so are our cost controls. There is currently a tremendous demand for "freedom" plans. Just look at the growth of AWARD Gold and PHP in 1985. We both did well. But now PHP has jeopardized its "freedom" status. For the future, this means plans like AWARE Gold and HMO Gold and other developing "combination" plans will take advantage of the gap PHP is presenting. "Freedom" plans are a direct outgrowth of the intense competition occurring in mature HMO markets like the Twin Cities.

REECE: Are we playing semantic games? Is "freedom" anything more or less than reprocessed and managed fee-for-service?

CZAJKOWSKI: No. Freedom to the physicians and hospitals means equal opportunity to participate in plans being offered. Freedom for the patient is flexible benefits plans that allow patients to decide what doctors and hospitals to choose.

REECE: Perhaps we ought to switch the subject. I hope to interview PHP to get their views on the "freedom" issue. What do you think of the recent resignation of Leonard Schaeffer as head of Group Health?

CZAJKOWSKI: We're pleased to welcome Leonard to the Blue Cross and Blue Shield organization. He will be an asset to our plans. We're glad he views Blue Cross and Blue Shield as an opportunity for career growth.

REECE: Before you became President, Minnesota Blue Cross-Blue Shield was losing $26 million a year. Now you're making $7 million. What caused the turnabout?

CZAJKOWSKI: Many things. We became innovative in our marketing. We introduced cost control programs. And we adopted a team approach to managing our multiple plans. That we are all present for this interview reflects the spirit of this team approach. AWARE and AWARE Gold got us back in the market, and we've been growing ever since.

We designed AWARE Gold to compete with HMOs, and we've gained over 140,000 members since February 1985. It's true Gold is more expensive and extensive than plans with deductibles or co-payments, but we're back in the market, and we're making money. And young people are coming back into the fold.

REECE: I have a sense AWARE Gold is upsetting the delicate equilibrium among HMOs in the Twin Cities. The January 10, 1986 issue of the *AMA News* puts it this way: "The rise of the giant indemnity insurers from their somnolence has shaken the HMOs in the Twin Cities from their complacency and has triggered a cascade of mergers, consolidations, acquisitions and alliances that are transforming the health care delivery system in the metropolitan area." In other words, to stay alive, nobody can do business the way they used to. A traditional HMO in this market is not enough. Do you agree?

CZAJKOWSKI: I agree.

REECE: The market is changing. A pause is occurring in HMO growth, people are looking at other alternatives, and patients and doctors are uneasy and suspicious.

CZAJKOWSKI: You're right. People now realize it is not in their best interest to be exclusive. They don't want to get locked in. We have always felt exclusivity is a bad thing. After doctors sign an exclusive arrangement, often at the urging of a manager, they awake to find they have sold the store. The halo effect of exclusive arrangements with HMOs is gone.

One of the biggest indications lies in what HMOs themselves are doing. Group Health and Prudential are promoting CHOICE-PLUS, and PHP is pushing its combination plan. To gain market share, HMOs are reaching outside their network and saying patients can go anywhere or to anybody, for a price, of course.

REECE: What are combination plans?

CZAJKOWSKI: Combination plans are PPOs. If you go to a preferred network, say PHP, you get full coverage. If you go outside the network, you get coverage subject to a deductible and co-payment. You get lesser coverage. The incentive is to stay inside the network. MedCenters also offers a combination plan similar to our HMO Gold.

What the HMOs are saying is: "Look, if we're going to grow, we've got to grow in a different way." And that way is to emulate what the fee-for-service model is. They can't penetrate the market beyond the level they're at, because patients and doctors don't want to get locked in.

REECE: So how do you keep from being locked in, say, with Group Health?

CZAJKOWSKI: Well, Group Health now accepts fee-for-service patients. That acceptance represents a drastic change from their original staff model concept. If you go to Group Health and want to go outside the system, you go under the Prudential program, and they pay up to 80 percent. You get lesser coverage so you can have freedom.

Patients are saying: I want my freedom. I want my independence. At the same time, I don't want to deal with paperwork, and I need predictability of payment. I want the best of all worlds: Freedom of choice of doctors and hospitals and predictability of payment without paperwork.

REECE: So that's where AWARE Gold entered the picture?

CZAJKOWSKI: Exactly. That's why we offered AWARE Gold. It eliminates paperwork. It offers broad protection, and it gives patients freedom. AWARE Gold is causing HMOs to rethink their strategy.

AWARE Gold has a couple of other advantages. We have a much larger network than HMOs. You don't have to go outside. Once you get outside the PHP network, you don't have a negotiated schedule. We also have experience with fee-for-service coverage. Now HMOs are playing on our turf. We know our turf. We have cost containment built into a more fluid system. HMOs don't. They have cost containment in a rigid network. Once they get outside their network, they are in trouble because they have no control. Our computer systems can monitor almost any situation; theirs cannot. It's now our ball game.

REECE: What do doctors say about AWARE Gold?

CZAJKOWSKI: They love it. So do the patients. When the state of Minnesota employees had open enrollment, we gained 3,600 contracts. That translates into about 10,000 new members, all of whom came from HMOs.

REECE: Is there federal enrollment for HMOs in Minnesota?

CZAJKOWSKI: Yes, on about 20,000 federal employees. We won't know the results until later in March. We expect to gain 2,000 to 4,000 contracts.

BRAINERD: As the person who runs HMO Minnesota, I can't resist commenting that we will be combining our HMO Minnesota network with the free choice of AWARE Gold. Patients will have full coverage if they go to HMO Minnesota, 80 percent if they go outside.

REECE: Why are you combining plans?

BRAINERD: We're not going to be good long-term players in this marketplace if all our primary care clinics are tied up into closed networks. For flexibility, we're combining our HMO Minnesota primary care network with AWARE Gold.

REECE: Tell me, how big a threat is it when competing HMOs go out and buy a clinic or set up an exclusive arrangement?

CZAJKOWSKI: It's a big threat. We lose business, and physicians lose incentives because they don't own their own business anymore. When physicians lose incentives, they lose productivity.

GJELTEN: Buying out of clinics by HMOs varies in this state, and is most intensive where HMO market penetration is the highest. Southern Minnesota is still virgin territory for HMOs. In St. Paul, HMO market penetration is much lower than Minneapolis. In southern Minnesota, the clinics are waiting to see what Mayo does with its HMO. What we want to do is interest as many clinics as possible in HMO Minnesota so they can have our marketing skills and their freedom.

BRAINERD: By combining our HMO Minnesota and AWARE Gold plans, we believe physicians will feel the impact of combined corporate membership.

REECE: Tell me about HMO Minnesota and Coordinated Health Care - HMOs the Blues run. How are your two HMOs working?

BRAINERD: The two work well, particularly in St. Paul where the combined membership makes us the dominant market force. The combined membership of almost 100,000 gives us a stronger basis to negotiate than in the past and helps both organizations.

REECE: Why are you so confident in this new multiple-option marketplace?

CZAJKOWSKI: Because we've got a number of approaches and the ability to administer and track all of them. We have the right skills. Besides, our data collection and daily reporting is better right now than anybody else's. We can tell clients what's happening in utilization.

Also, we have acquired a third-party administrator, CC Systems, that gives yet another approach. Self-administration comes in where groups pay their own claims. Owning a self-administration company gives us an entry into groups we couldn't deal with before.

REECE: You seem to have enormous faith in your computer system.

CZAJKOWSKI: We do. In the mid 70s, we had problems paying claims. But we learned, we've spent over $20 million making sure the system works and it is the best. Our system is better than the rest.

REECE: You're going to have to justify that claim.

CZAJKOWSKI: We process a half million claims a month. We're used to dealing with a multitude of providers. The HMOs started out with a one-or two-provider operation, a very simple system. You can't build on it. It's a patchwork, and it gets weighted down with enhancements. We hear competing plans are experiencing significant backlogs of unpaid claims.

REECE: You have a mature, high-production system?

LITTLE: High production causes you to be very disciplined in what you're doing. When you're dealing with six million claims a year, you have to be highly disciplined. Also, one of our traditions is we keep a lot of data. Storing this data and the long-term track records of an account for years gives you tremendous oneupmanship. Our commercial competitors get the data, pay the claim, and purge the data.

BRAINERD: Blue Cross has many benefit plans from HMOs, to a variety of first-dollar coverages, to high deductibles and co-insurance plans. HMOs historically have had only one plan, one set of benefits, and one philosophy. When you start getting into multiple options - senior plans, regular plans, and combined plans - you need the ability to process. We have it. We have an integrated system constructed to handle multiple providers and multiple benefits and multiple programs. Our system is the model across the country.

REECE: Why are you considered so innovative among your peers across the country?

GJELTEN: AWARE. AWARE Gold. HMO Gold. Cost Containment. EFFECTIVE CARE - a program that reviewed inpatient psychiatric and chemical dependency stays and saved over 15,000 days in Minnesota since 1981. Also, we offer a complete range of benefits - not just health - but 401(k) plans, dental, life, disability. That kind of diversification is not unique, but it's very uncommon. When you're a company dealing with a carrier, it's important to provide all the lines you've got.

REECE: Tell me how you got to your present market position.

HOPKINS: It began in the early 1970s with our heavy investment in the computer systems. Then in 1974 we started *HMO Minnesota*, considered daring at the time. But AWARE was certainly the most daring thing we did. AWARE was a PPO before there was such a thing as a PPO - it had one set of benefits if you stayed within the network and a different set if you went outside.

The AWARE idea dawned in 1983. In effect it changed the entire method of reimbursement for all of our business. The AWARE program now has 500,000 members. We've got 5,800 physicians and all 180 hospitals. We direct patients to those who participate.

Think of the AWARE concept. In less than a year's time, we made a radical change from being a total freedom of choice, fee-for-service organization to a negotiated, prospective hospital reimbursement program. That was the turning point. That set the stage for the AWARE Gold program.

It was radical because we moved to a prospective hospital reimbursement system when all of our competitors were looking strictly at discounts. We were the first to introduce prospective payment, before DRGs.

REECE: So how many stages did you go through to reach your present level of maturity?

CZAJKOWSKI: There were three stages. First, there were the AWARE hospitals, the prospective reimbursement system; then the AWARE physicians' program, which said physicians would have to use AWARE hospitals and would agree to preauthorization and utilization control, and then AWARE Gold in which we emulated HMO coverage and paid office calls on a first-dollar basis.

Do you know who designed the AWARE structure? The providers, that's who. We asked the hospitals and physicians what they wanted - and the AWARE system was it. So, in a real sense, when we say our patients, our physicians, and our hospitals "call the shots," we mean it.

REECE: You have described three stages. What is the fourth stage?

HOPKINS: It is the MEDISGRPS computer system. It is a system developed at Saint Vincent's Hospital in Worchester, Massachusetts by two clinicians, Brewster and Jacobs, over ten years ago. It is based on key clinical findings to describe the severity of illness in patients who had different reasons for admission. They attribute to each clinical finding a degree of severity - 0, or 1, 2, 3, or 4 - depending on whether that finding is acute or likely to lead to organ failure.

REECE: Are you excited about this?

CZAJKOWSKI: We're very excited about it. It's now in all the metropolitan hospitals and about eight of the largest hospitals outside of the Twin Cities. We can look into individual physician performance based on reasons for admission. We can find out what the problems are.

HOPKINS: This is the fruition of a four-year strategy - AWARE for hospitals AWARE for physicians, AWARE Gold to emulate HMOs, and now MEDISGRPS. All the pieces are falling together.

CZAJKOWSKI: Quality *is* the future - *if* you can measure it. Quality is the jumping off place for the future. And the marketplace will go to those who can define quality, measure it, monitor it, and reward it.

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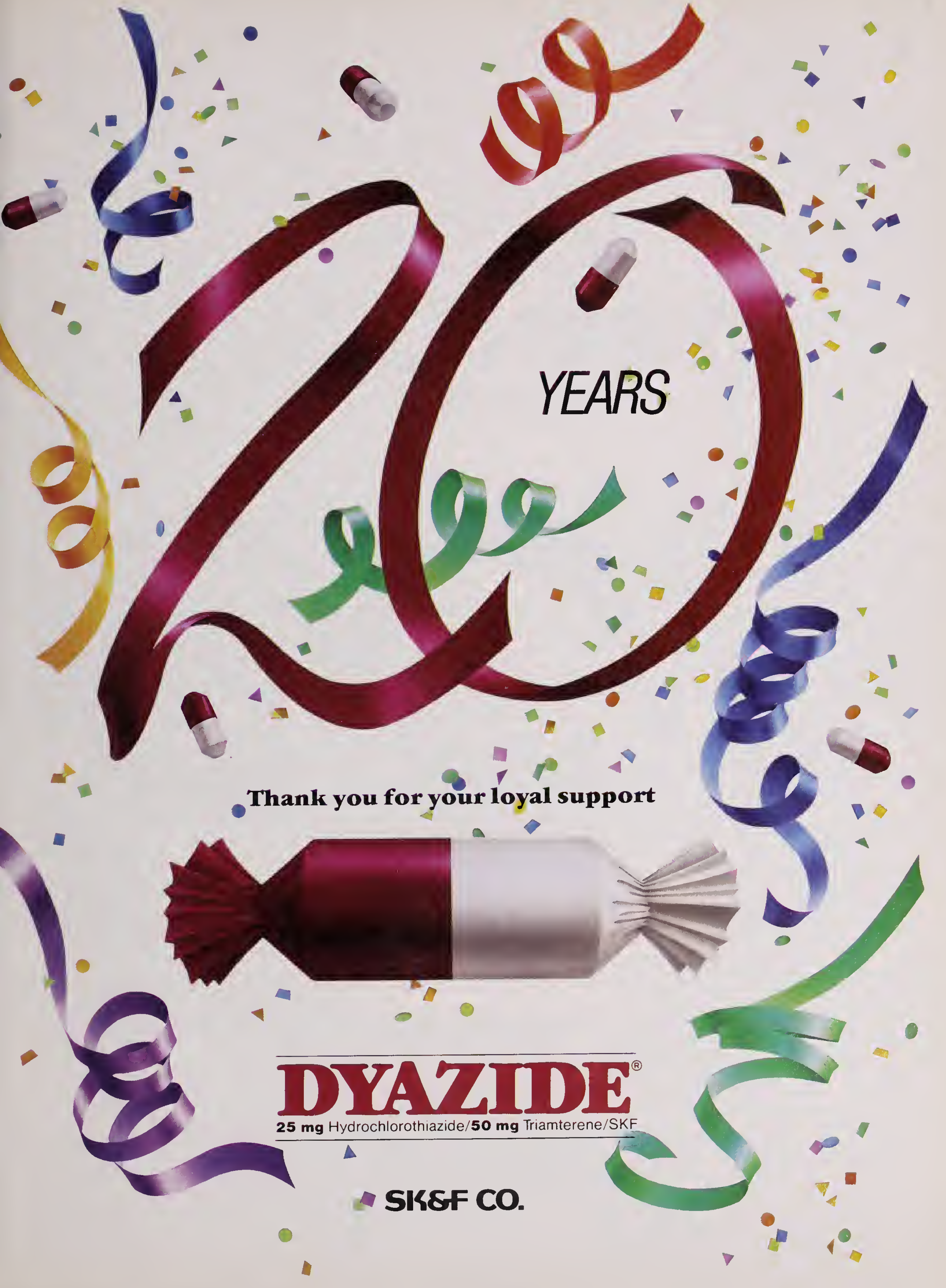

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MMA Board of Trustees Reports 1985 AMA Delegate and Alternate Delegate Nominees

The MMA Board of Trustees submits herewith the AMA Delegate and Alternate Delegate nominees and their profiles. Additional nominations will be accepted from the floor of the House on May lst. The election will take place during the May 2nd session of the MMA House of Delegates.

Delegates (3 to be elected)

William E. Jacott, M.D.

Dr. William E. Jacott, chairperson of Minnesota's delegation, has been a delegate to the AMA since 1980, prior to which he served four years as an alternate delegate. Extremely active in the AMA, he currently serves as chairman of the AMA's Council on Medical Education. In addition, he will become president of the Federation of State Medical Boards in May.

Board certified in family practice, Dr. Jacott practices with the Duluth Clinic, Ltd., a large multi-specialty group. He has been a member of the Minnesota State Board of Medical Examiners since 1976. He is a recipient of the Teacher of the Year Award from the Minnesota Academy of Family Physicians.

Severin H. Koop, Jr., M.D.

Dr. Severin H. Koop, Jr. is a board certified otolaryngologist practicing in St. Cloud and a delegate to the AMA since May, 1983. A past-president of the MMA, Dr. Koop served as speaker of the MMA House of Delegates from 1978 to 1980 and as vice speaker from 1975 to 1978. He is a director of the Physicians Philanthropic Foundation of the MMA.

Over the years, Dr. Koop has been active on numerous MMA committees and has participated regularly in the activities of the Stearns Benton County Medical Society. In 1975, he was president of the Minnesota Academy of Ophthalmology and Otolaryngology.

Richard B. Tompkins, M.D.

An internist at the Mayo Clinic, Dr. Richard B. Tompkins has been a delegate to the AMA since 1985, after serving four years as an alternate. In addition to serving as president of the Minnesota State Board of Medical Examiners, Dr. Tompkins has been active on a number of MMA committees, including the Medical Practices and Planning Committee, which he has chaired since 1982, the Rheumatic Diseases Committee which he chaired in 1980-81 and the Nominating Committee. He is also a member of the MMA House of Delegates.

Alternate Delegate (3 to be elected)

James F. Knapp, M.D.

Dr. James F. Knapp is a board certified family physician in Detroit Lakes and since 1982 has been an alternate delegate to the AMA. He was selected to represent the MMA on the AMA's Health Policy Agenda Advisory Committee. In addition to serving on Committee on Administration and Finance, Dr. Knapp currently chairs the Minnesota Medical Services Corporation and the Professional Information Corporation. He was chairman of the MMA Board of Trustees from May, 1979 to May, 1982 and served on the Board from May, 1975 to May, 1982.

Dr. Knapp is president-elect of the MMA.

Audrey M. Nelson, M.D.

Board certified in rheumatology and internal medicine, Dr. Audrey M. Nelson practices at the Mayo Clinic where she is a member of the Board of Governors, a member of the Foundation Board of Trustees, and an assistant professor of medicine.

She has been a member of the Women Physicians Committee since 1982 and served on the Ad Hoc Committee for the formation of an MMA Hospital Medical Staff Section. In addition, she is a past-president of the Zumbro Valley Medical Society and a fellow with the American College of Physicians.

Donald C. Bell, M.D.

Dr. Donald C. Bell is board certified in internal medicine and practices in Minneapolis. He was elected to serve as an AMA delegate in 1985. In 1983, Dr. Bell served as president of the MMA. From 1974 to 1975, Dr. Bell served as first vice-president on the Hennepin County Medical Society's Board of Directors. In 1978, Dr. Bell served as chairman of the board of the Foundation for Health Care Evaluation. Dr. Bell was elected to the MMA Board of Trustees in 1979 and re-elected in 1980 for a three year term. Currently, he chairs the MMA Committee on Ethics.

A Simple Reversible Cause of Infant Upper Airway Obstruction

BRIAN W. BLAKLEY, M.D.* and
KENT S. WILSON, M.D.†

Stridor is a common reason for hospital admission and investigation in infants. Although commonly overlooked, the nose may be a site of pathology that causes the stridor. This paper reminds clinicians to consider the nose in these illnesses. One such case is presented.

A two-week-old male infant was admitted to the Pediatric Service with a diagnosis of respiratory infection. He had a fever of 103°F, a history of poor feeding, and an infiltrate on chest Xray. He was the product of a 38-week pregnancy that was without complication. After taking breast feedings well for his first 10 days, he seemed less interested in feeding and then became febrile and had apparent breathing difficulty. Intubation was considered. The Otolaryngology Service was asked to assess the upper airway because sternal retractions on inspiration were present. Pulse was 180 and respirations 60.

On examination, the child did indeed have sternal retraction on inspiration, but this seemed to be only when the mouth was closed. There were also sounds of marked nasal stuffiness and congestion. On strong stimulation, an occasional inspiratory stridorous sound was heard. It was the examiner's impression that nasal obstruction was the primary clinical problem. Oxymetazoline, 0.25% was sprayed into each nostril. Within minutes, the sternal retractions were gone; the nasal stuffiness was not apparent; and the child was able to relax and sleep. Two days later the patient was discharged on oral antibiotics.

Commentary

The nasal spray did not cure this patient's primary problem. We would like to point out, however, that sprays can be very helpful in upper airway obstructive situations caused by mucosal edema. Infants are obligate nasal breathers and, as such, experience considerable improvement if obstructed nasal passages can be opened. The drops or spray are usually needed for only two to three days until natural defense mechanisms or medical

TABLE

Generic and Brand Name Nasal Sprays and Drops[2]

Xylometazoline	0.1%	Neosynephrine II - Long acting, nasal spray/drops, adult strength Otrivin - Nasal spray/drops, adult strength Sinutab - Long acting, nasal spray 4-way - Long acting, nasal spray
Xylometazoline	0.05%	Neosynephrine II - Long acting, pediatric drops Otrivin - Pediatric nasal drops
Oxymetazoline	0.05%	Afrin - Nasal spray/drops Dristan - Long acting, nasal mist Duration - 12 hour, nasal spray Long Acting NTZ Neosynephrine - 12 hour, nasal spray, adult strength Sinex - Long acting, nasal spray
Oxymetazoline	0.025%	Afrin - Pediatric nose drops Neosynephrine - 12 hour pediatric drops
Phenylephrine HCl	0.25%	Neosynephrine for Adults
Phenylephrine HCl	0.50%	Dristan - Nasal mist Duration - Mild 4-hour nasal spray Neosynephrine for Adults Sinex - Nasal decongestant spray 4-way - Nasal spray
Phenylephrine HCl	0.125%	Neosynephrine for Infants
Ephedrin sulfate	0.5%	Vatronal - Nose drops

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therapy can alleviate the underlying condition.

The most significant contribution to total airway resistance is that given by the nose. As such, it is not surprising that small alterations in nasal airflow may have important consequences. The nose may account for as much as 40% of total airway resistance.[1] The resistance is proportional to the inverse fourth power of the diameter of the tube through which it flows. This may be stated quantitatively by the equation $R=K(PLV/D^4)$. Where R equals resistance, K is a constant, P equals gas density, L equals tube length, V equals velocity of flow, and D equals diameter of the tube.[1]

It is our impression that reversible nasal obstruction is not frequently considered as an etiology for respiratory distress in infants. Nasal decongestant drops or sprays can be of value therapeutically and diagnostically and their use should be considered more often. This is a single modality which gives rapid results, readily appreciated by both parents and physicians. Infant strength (0.125%) Neosynephrine drops are available as well as other pediatric and adult sprays and drops. Clinicians should be aware that the name Neosynephrine applies to several formulations of different generic drugs. This is summarized in the Table. Although the brand names may present a confusing picture, the generic products are formulations of different strengths of phenylephrine, oxymetazoline or xylometazoline. These drugs are very safe. Their only significant side effects are possible local nasal irritation and the possibility of aggravating hypertensive states. Rhinitis medicamentosa may occur if these agents are used longer than a week.

Viral and bacterial infections and allergies are common causes of nasal and upper airway destructions. These are also common etiologic agents in lower airway disease. Although complete evaluation of the respiratory system should be the rule in cases of respiratory illness severe enough to warrant admission, the initial organ of respiration, the nose, is often not considered. If general principles of nasal physiology are kept in mind by physicians, many patients stand to benefit from conservative use of nasal decongestant sprays or drops.

Conclusion

Nasal pathology should be considered in any airway obstruction illness.

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Aggressive Behavior in Acinic Cell Carcinoma

NEIL R. HOFFMAN, M.D.*,
RICHARD LEVINSON, M.D.†,
and CARL A. BROWN, M.D.†

Acinic cell carcinoma is generally thought to be a slow growing, indolent type of tumor originating in the salivary glands. This malignancy is found most commonly in the parotid gland. It is seen in all age groups, and has a slightly higher incidence in females. Acinic cell cancers usually grow slowly, and follow a benign course. Surgical excision is the preferred treatment of choice, and we feel that long term follow-up is necessary, as these tumors may recur after many years. Two cases are presented that exhibit aggressive behavior, both locally as well as distally. Therapeutic implications are discussed.

Acinic cell carcinomas are uncommon salivary gland neoplasms, that were initially reported in the 1950s by Foote[1] and Frazell[2]. Salivary gland cancers comprise about six percent of all head and neck cancers. Of all salivary gland tumors, only thirty percent are found to be malignant[3,4]. Acinic cell cancers were initially felt to be benign, and long term follow-up of these cancers was not stressed. Buxton[5], in 1953, had shown that acinic cell tumors were malignant and can invade locally. Later it was appreciated that acinic cell cancers can also metastasize to distal sites[6-9].

The histologic variance of this tumor has made classification difficult. Recently a parotid tumor with both ductal and acinar differentiation has been reported[10]. It is currently felt that the ductal epithelium has the capacity to differentiate along both cell lines. Acinic cell cancers arise from the acini, and are most often found in the parotid gland. Fifteen to twenty percent of these tumors will, if followed long enough, metastasize[11].

Case Reports

Case 1

A 56-year-old male was presented with a painless enlarging mass in the area of the right parotid gland. There were no associated symptoms of nerve involvement. Mastication was normal, and there was no associated pain. There was no evidence for a recent, upper respiratory infection or trauma. A metastatic evaluation was negative. The patient was explored, and a diffuse parotid enlargement was found, with dense fibrous tissue surrounding the facial nerve. Histologic examination was diagnostic of an acinic cell cancer of the parotid gland. A total parotidectomy was then done. The surgeon felt that all the local tumor had been removed, and this was supported by the pathology review. Following surgery the patient was closely followed for one year, with no evidence of recurrent tumor. Eighteen months post-operatively the patient presented with left thigh pain. A neurologic examination was normal. Locally there was no evidence for recurrent tumor. A C.T. scan revealed a pelvic mass with a lytic lesion involving the ramus of the left pubic bone. Biopsy of this lesion revealed metastatic acinic cell cancer, compatible with the earlier parotid lesion. Attempts to control this tumor were not successful, and the patient went on to die of disseminated acinic cell cancer 25 months after the intial presentation.

Case 2

A 62-year-old male was presented with a painless enlarging mass in the left parotid area in 1962. At that time a metastatic evaluation was negative, and surgery was performed. A mass in the parotid was noted, and a superficial parotidectomy was done. This patient was followed closely for two years and was then lost to follow-up until 18 years later, when he experienced facial pain, and noted a mass effect in the area of previous surgery. Surgical re-exploration was done. Biopsy demonstrated recurrent acinic cell carcinoma, and the patient underwent a total parotidectomy. The surgeons felt now the facial nerve was involved. A thorough evaluation, including CT scanning was negative for recurrent tumor. The patient was again observed closely, and three years later, or 21 years after the initial presentation of acinic cell cancer, and three years after a local recurrence this patient was felt to have local regional disease. Dissection and compression of the facial nerve and neck dissection revealed metastatic acinic cell cancer. There was tumor in the jugular vein, as well as involvement into the base of the skull. The patient was treated initially with radiation therapy, and because of persistent symptoms with adriamycin, bleomycin, vincristine, and Cis-platinum. His disease has stabilized, and he is continuing to be followed.

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Discussion

The causes of salivary gland tumors are not known. Radiation therapy given for non-malignant conditions may, however, cause an increase in salivary gland proliferation. Survivors of atomic bomb radiation years later had an increase in salivary gland tumors[12].

Preoperative assessment in patients with salivary gland tumors is generally based on the size of the initial mass, clinical growth, facial pain, and the presence of nerve involvement. Sialography, C.T. scanning, and scintigraphy have not been terribly helpful in showing the extent of local involvement[13].

Parotidectomy is the preferred modality of treatment. Radical neck dissection has not shown to be of benefit in either local or distal disease-free intervals[14]. This is because the tumor may spread via the blood stream, as well as lymphatics. With incomplete removal, almost fifty percent of patients will recur. Most clinicopathologic series conclude that no prediction can be made by the histologic grading to clinical correlation. Pain, a common symptom associated with acinic cell cancers does not indicate a poor prognosis. Facial nerve involvement, however, does tend to indicate a more aggressive tumor. Treatment for acinic cell carcinoma should encompass a parotidectomy, with wide margins. Neck dissection, in the absence of clinical nodes, does not seem warranted[15].

Local excision of the tumor mass is associated with a high rate of recurrence. Radiation therapy has not been effective as a primary treatment mode[16], although used as an adjuvant to surgery does seem to improve local recurrences, especially if there is previous cellar or neural involvement[17]. Chemical therapy with Cis-platinum has the potential to act as a radio-sensitizing agent in low dose, as well as an adjuvant to surgical therapy. Acinic cell cancers generally follow an indolent course, and have been felt in previous series to impart good survival. Recently there have been reports of this entity having the potential to metastasize, and show a more aggressive clinical behavior. The two patients presented here, as well as the recent literature review, show the need for long term follow-up in patients with acinic cell cancer. A need to develop evaluation criteria to predict aggressive behavior exists, especially as our treatment modalities improve.

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Surgical Procedures in Adult Rheumatoid Arthritis

DONALD P. BRAUN, M.D.*

The debilitating nature of rheumatoid arthritis with destruction of musculotendinous units and joint destruction offers a variety of challenges to the orthopedic surgeon. The purpose of this paper is to discuss briefly current trends in the treatment of rheumatoid arthritis. The first part of this series will deal with the efficacy of total joint procedures, and the second portion will discuss adjunctive procedures related to soft tissue problems.

Reconstructive procedures involving patients who have inflammatory arthritis carry a different risk pool than patients with osteoarthritis. These patients have been dealing with a chronic debilitating disease, and frequently, muscle strength, ligamentous integrity, and even overall nutrition have been compromised. It is well recognized that the risk of an infection following arthroplasty is increased in rheumatoids for a variety of reasons related to white cell dysfunction, steroid use, and the use of antimetabolites.

The success of total joint arthroplasty has varied from joint to joint, and the following order, in general, reflects the state of the art from most successful to least successful in rheumatoid arthritis.

1. *Total hip arthroplasty* has been used in its present form since 1969 in the United States. Basically, it is a high density polypropylene acetabular cup which is fitted to a metal femoral component. Both components are cemented in place with polymethyl methacrylate. The metal on polyethylene concept, i.e., the "low friction arthroplasty," has been successful and adapted to the remaining joint models. The chief risks involved are infection, postoperative dislocation, and loosening at the cement bone interface.

Loosening occurs frequently in rheumatoid arthritis because of inflammatory disease, frequent use of steroids and secondary osteoporosis. Juvenile rheumatoids will be more demanding of their prosthesis over a longer period of time than senior citizens. Recently, attempts have been made to eliminate the loosening problem by creating a prosthesis which does not use methacrylate for its seating, but allows ingrowth into the prosthesis itself of cancellous bone from the intramedullary canal of the femur. It is still speculative as to whether or not these ingrowth prostheses will lessen the overall incidence of loosening. It is not unusual to see patient's pain relief to be less dramatic than the cemented prosthesis because of the lack of rigid fixation of the femoral component initially. As total hip arthroplasty is currently practicd, average ten year success ratio overall is 75 to 80 percent of all prostheses.

2. *Total knee arthroplasty* was introduced into this country in the early 1970s. The design features of total knees have varied more than any other implant. Initially it was thought that the knee was primarily a hinged joint; later it was established that the knee has a hinged, gliding, rotating function with at least three degrees of freedom.

Multiple designs have been used. At one time, over 130 different types of total knee prostheses were offered. A popular current prosthesis is a Duo Condylar type femoral component which meshes with a metal-backed, polyethylene tibial component. This allows for both flexion, rotation, and glide. In the past, both of these components would be fixed with methyl methacrylate. As the capability of making precise cuts about the distal femur and proximal tibia improved, certain prostheses were placed without cement. The design characteristics seem to lend themselves better to non-cement fixation than the ball and socket hip joint. The difference between successive generations of prosthetic type makes comparison harder than in total hip arthroplasty. The failure rate for total knee arthoplasty due to infection is higher than total hip arthroplasty. Infection rates vary from 3.8 to 18 percent in the current literature. Knees seem more prone to infection because of their exposed position, and incisions about the knee do not heal as readily as in the soft tissues about the hip. It is not uncommon for multiple procedures to have been tried on the knee prior to the installation of a total knee arthroplasty, and this increases the infection risk.

Secondary bacterial seeding of the knee is more common and accounts for at least as many infections as primary infections at the time of surgery. Patients with implants should be covered with antibiotics at the time of any other type of surgical procedure, be it dental extraction, cystoscopy, cholecystectomy, etc.

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3. Total shoulder arthroplasty. The reports and series of total shoulder arthroplasties are more limited than knees or hips. Total shoulder arthroplasty may be either a metal on high density polyethylene glenoid cup, or simply a humeral head replacement. The chief limiting factor in reconstructive procedures about the rheumatoid shoulder is the marked soft tissue destruction which can destroy the rotator cuff. This may lead to an unstable shoulder postoperatively if an adequate cuff repair cannot be done primarily. Because of the difficulties with glenoid component fixation, if the glenoid is not severely destroyed, there is a trend to hemiarthroplasty with replacement only of the humeral side of the shoulder. Patients may reasonably expect to obtain approximately 110 degrees of abduction and 120 degrees of forward flexion after total shoulder arthroplasty. Some may do better, depending upon the status of their rotator cuff muscles at the time of surgery. This procedure offers excellent pain relief for the small number of people who have unremitting glenohumeral pain.

4. Hand. The dramatic changes that take place about the wrist and MCP and PIP joints are synonymous with rheumatoid arthritis. Replacement of MCP joints has become standardized hand practice in the past fifteen years.

Metacarpophalangeal arthroplasty has been more successful by far than PIP arthroplasty in rheumatoid hands. The choice between silastic arthroplasty, which is a silicone interpositional arthroplasty, or a metal on polyethylene type of cemented prostheses, has passionate advocates on each side. The prime surgical indication for MCP arthroplasty should be pain relief with the secondary advantages being cosmesis. The complex interplay of flexor and extensor tendon units with a basic muscle imbalance in the fine motor control of the hand due to rheumatoid disease makes reconstruction of these joints challenging. The tendency to recurrence because of progression of the disease remains present, however.

5. Foot. Foot deformities mirror hand deformities, and hallux valgus may become severe with destruction of the metatarsal phalangeal joints throughout the foot. The standard procedure has been resection arthroplasty which involves removal of the base of the proximal phalanx of the first toe, thus allowing a fibrous interposition arthroplasty. This is a very satisfactory procedure for pain relief. It can give some fairly good cosmetic results, however it shortens the big toe and frequently results in transfer weight bearing to the remaining metatarsals.

If the patient has hallux valgus with good circulation to the feet, replacement arthroplasty of the first metatarsal phalangeal joint has been advanced. The hinged silastic prosthesis versus a metal on polyethylene prothesis controversy again. The advantage of the silastic prosthesis is that it provides good correction of the hallux valgus, and good pain relief. Cosmetically it is preferable to the resection arthroplasty. Its disadvantages are the possibility of a fracture of the prosthesis, the possibility of wear with a resultant chemical synovitis from the small bits of silastic which are eroded off the prosthesis. The chief difficulty with the metal on polyethylene prosthesis seems to be loosening.

6. Wrist. Series of wrist arthroplasties are small. It would appear that this procedure is reasonable for control of pain relief if restricted to unilateral indications. The chief drawbacks are dislocation, loss of fixation and loss of correction of the carpus. Wrist fusion may be preferable to prosthetic replacement in the heavy laborer.

7. Elbow. The most common procedure done about the elbow is resection of the radial head because of deformity at the radiocapitellar joint. This may or may not be associated with silastic arthroplasty of the radial head. In theory, silastic radial head replacement will prevent shortening of the radius and subsequent pain at the distal radioulnar joint. However, in the inflammatory situation of rheumatoid arthritis, this theoretical advantage may not be true because of the common deformities at the distal radioulnar joint. To date, total elbow arthroplasty has proven a bugaboo. The inflammatory arthritis attacks the elbow joint with resulting loss of bone stalk of the distal humerus and the proximal radius and ulna. The joint itself is not strictly a hinged joint as originally thought, and its complexity has resulted in failure of most prostheses due to loosening. Even with the high rate of loosening for patients with severe elbow involvement, the current, imperfect prostheses do have a limited role.

8. Ankle. The difficulties are fixation of components because of the very small surface area on the talus which must take full body weight. Trying to balance implants the size of a fifty cent piece has given orthopedists difficulty. Postoperatively, a high percentage of these prostheses appear radiographically loose, yet the clinical correlation is not present, probably due to a decreased activity level of patients with rheumatoid arthritis.

Part II

The previous discussion of total joint arthroplasty has been a sort of consumer reports from best to worst on the status of total joints. In addition to joint replacement, there are multiple adjunctive procedures which I would like to briefly discuss.

1. Tenosynovectomies. Build-up of synovial tissue and fluid inside of the tendon sheath rapidly causes atrophy, and eventual avascular necrosis of the tendons themselves. It is a good indication to proceed with tenosynovectomy if these swollen areas of tendon pressure have been present for several months without response to conservative treatment. The prevention of an extensor or flexor tendon rupture is preferable to a repair of the atrophic tendon. It is especially important to beware of tendon ruptures about the wrists, the flexor aspect of the palm, the quadriceps, and Achilles tendons.

2. Joint synovectomy has had a controversial career and currently surgical synovectomy appears to have a fairly limited indication as an isolated procedure. There does seem to be a consensus that synovectomy does not prevent cartilage destruction in the long run, but it may control pain in the short term. Its most common use is in the knee and in the elbow. A very recent review of synovectomy in juvenile rheumatoid arthritis states that it has no use at all.

3. Dissecting popliteal cysts. It may be difficult to distinguish dissecting popliteal cysts from deep vein thromboses. The ultrasound may even be negative in the presence of a popliteal cyst. The best procedure, when in doubt, is to carry out an arthrogram and also make sure a thirty minute delayed lateral film is taken to rule out the dissecting popliteal cyst prior to anticoagulation for deep vein thrombosis. For recurrent symptoms, excision may be indicated if synovitis is uncontrollable with medical treatment.

4. Bumpectomies. Removal of nodular rheumatoid deposits should be done before skin breakdown if these patients fail chemical treatment.

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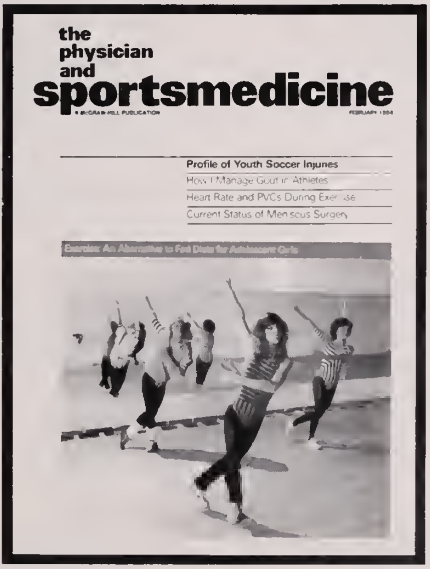
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Chemical Disaster Drill in the State of Minnesota

KUSUM SAXENA, M.D.,[*] + JAMES J. CICERO, M.D.[*] and WAYNE F. HASS, M.D.[*]

Chemical spills have become a common problem. The accident can easily lead to a disaster which would test the abilities and resources of any one public law authority or municipality for this purpose. The State of Minnesota conducted a multijurisdictional learning drill which presented many valuable lessons should a chemical disaster occur.

The present day environment can be contaminated with chemicals which could prove disastrous to mankind at any given moment. Chemical spills occur at the rate of 80 per year. Some are major incidences involving lethal gases such as the methylisocyanate gas leak in Bhopal, India, which took a toll of over 2,500 lives. Another potential for a chemical disaster resides in the transportation of hazardous substances. These hazardous materials may be present within the state boundaries of Minnesota at any given moment. Recognition of this fact allows for the possibility of a hazardous material spill or accident at any time. If such an accident were to occur, especially in or near the metropolis, it could quickly exceed the ardent abilities and resources of any one public law authority or municipality.

With this perception in the background, a unique exercise was planned with the impetus coming from the State of Minnesota. The governor and the Public Safety Commissioner requested that such an exercise be conducted. The Department of Public Safety - Division of Emergency Services took the initial steps towards conducting a multijurisdictional learning drill. In fact, planning and handling a disaster drill is half the battle in case of a disaster. Therefore, in the planning process the following objectives were delineated.

Objectives

1. Demonstrate the capability to make a coordinated response to a hazardous materials incident by dispatching the appropriate local and state response vehicles and teams.
2. Exercise chemical disaster emergency plans between Hennepin County, Ramsey County, the cities of Minneapolis and St. Paul, the University of Minnesota, and other political jurisdictions by creating a situation that exceeds the capability of any single jurisdiction to effectively respond.
3. Meet the information needs of FEMA (Federal Emergency Management Agency), the State of Minnesota, Hennepin and Ramsey Counties, Minneapolis and St. Paul, the University of Minnesota, and other concerned municipalities by establishing on-site communications from a hazardous materials incident scene to these jurisdictions.
4. Demonstrate the ability to notify and assemble emergency response personnel not only at the scene of a chemical disaster, but also at Emergency Operating Centers which would manage such an emergency.
5. Demonstrate the ability to cooperatively and effectively manage hazardous materials accidents in the Minneapolis-St. Paul metropolitan area.
6. Demonstrate the capabilities of a major hospital's emergency room to handle the chemical disaster.

Planning of the Exercise

The exercise was designed in a series of meetings which began on August 22, 1984, and continued up until February 19, 1985, with the drill on February 26, 1985. The exercise involved six political jurisdictions (Cities of St. Paul and Minneapolis, Ramsey and Hennepin Counties, University of Minnesota, and State Emergency Medical Services). Two of the authors (K.S. and J.C.) were actively involved in the planning. and two authors (W.H. and K.S.) participated in the exercise. Besides the planning meetings, there were four sessions with health/medical transportation/public works, traffic control and public information personnel to facilitate their involvement. The news media was involved early to forewarn the public that the event was only an exercise.

The Disaster Site

Since several chemical and manufacturing facilities are located in the St. Anthony Park area of St. Paul adjacent to other commercial storage and transportation/manufacturing facilities in Southeast Minneapolis, this site was chosen to perform the drill. This area has a major highway running north/south (Highway 280) and major tracks of Soo Line, Chicago Northwestern, and Burlington Northern Railroads traversing the area in an east/west direction.

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Scope of the Drill

A simulated railroad accident involving the derailment of railroad cars carrying toxic and explosive hazardous materials was planned. The accident was caused by a chemical cargo truck that lost control on an icy road. The scenario required the response of police, firefighters and ambulances from Minneapolis and St. Paul. A toxic cloud resulted in a decision to evacuate portions of both cities. Other ordinary day-to-day routines severely taxed the response resources of both jurisdictions so requests arouse for aid from the state, federal, and county governments. Monitoring of the disaster and orchestration of the evacuation and its related complications activated the Emergency Operating Centers (EOCs) of all the affected jurisdictions. These jurisdictions also provided information to the public, the media, and other levels of government as their primary off-site responsibility.

The Scenario

On Tuesday, February 26th at 9:07 a.m., a Chicago Northwestern train hauling several tank cars and piggyback cars was hit by a chemical cargo truck that swerved. Flames spread in the southwest direction along with winds of 45 miles per hour. The first response participants at the scene recognized that a severe hazard remained to the people nearby and also to those people considerably downwind from the chemical disaster scene. Once realized that the danger had far exceeded the capability of forces on the scene, (Minneapolis, and St. Paul fire chiefs) first response teams recommended evacuation of parts of St. Paul and Minneapolis

Response and Sequence of Events

1. Accident occurs near Kasota Avenue on Minneapolis/St. Paul border across from 500 Kasota. Explosion and fire occur.
2. Minneapolis and St. Paul Safety Services respond.
3. Situation evaluated and field command post established.
4. State HAZMAT team responds.
5. Activation of EOCs.
6. Evacuation ordered.
7. Medical effects cause increased need for medical personnel.
8. Termination of event.

The Regional Poison Center was able to catch the news on the air, and they contacted the EOC for information on the chemicals. The Poison Center was given the following information by the charge person on the scene.

The train consisted of the following in sequence:

1. One tank car of anhydrous ammonia.
2. Two tank cars of gasoline.
3. One hopper car of ammonium nitrate fertilizer.
4. One empty boxcar.
5. One tank car of fuming sulfuric acid.

The truck had the following chemicals:

1. Aluminum hydride (phostoxin).
2. H.T.H.
3. Insecticide, liquid, NOS Furadan 4, 2-55 gallon drums.
4. Compound weed killing liquid, NOS prowl, 2-55 gallon drums.

The paramedical personnel were alerted to the dangerous nature of the substances and the need for decontamination. In the simulation, people were brought to the first aid station set up near the scene for treatment of breathing and visual problems.

The exercise started at 0911 hours. By 1030 hours, the Fire Captain on the scene reported that the fire was out; all victims had been transported; leaks were controlled; and clean up crews were on the way. The police and military provided control and security at the scene.

At 1400 hours, State EPC reported to Ramsey County EOC that there should be evacuation of residents at risk from the accident at Highway 280 and Kasota, and the surrounding area of 2.2 miles by 1.5 miles should be evacuated. The police at that point were asked to define the street boundaries encompassing the above-mentioned area. Later, as the direction of the wind changed, the evacuation order was cancelled. The exercise was completed at 1430 hours.

In a real situation, this would have involved approximately 100,000 people at risk and in need of immediate evacuation. In addition to two major businesses near the accident site, the area also included the main campus of the University of Minnesota with a population estimated to be approximately 60,000.

Response of One of the Participating Medical Centers

The Emergency Medicine Department of St.

Paul-Ramsey Medical Center was alerted and responded by activating their disaster plan. One of the authors (W.H.) managed the decontamination and treatment recommendation in collaboration with advice from the Minnesota Poison Control Center. He also directed the ambulances to available beds throughout the St. Paul area. As most of the presumed symptomatic patients were ambulatory and came to the hospital after having received first aid, the Emergency Medicine Department assumed that they would be able to handle the patients and did not transfer inpatients to other hospitals. Metropolitan Transit Commission (MTC) buses were utilized instead of ambulances which is a part of the normal transportation plan.

Observations and Problems

1. Notification for the activation of their Emergency Operating Centers (EOC) among participating agencies was not effectively accomplished. The Metropolitan Regional Coordinator of the Division of Emergency Services is developing a solution to this problem.
2. The prepublished list of chemicals involved in the exercise was not correctly reported to the state EOC.
3. Exercise communications between participating Emergency Operating Centers were ineffective and, in some cases, nonexistent. The need for more effective communications in order to be of mutual support will be discussed using the experience of this exercise so that all agencies understand the importance of effective communications.

Did We Achieve the Prestated Objectives?

If primary consideration is given to the purpose of the drill, then the answer is *YES*. There are two potential aims for a simulated exercise, learning and testing. We feel this was a good exercise. Many different jurisdictional agencies were able to work together. Considering the magnitude of the disaster, the response coordination was acceptable. We did find that traditional Poison Center references were inadequate to the tasks presented by this exercise. The exercise also presented questions which would be very difficult to answer in the real situation (e.g., When can people return to their homes?, What happens to the food in the house sitting in cabinets and counters versus in the refrigerator when the toxic cloud passes over or through that house?).

Precautions

It is crucial that only appropriately designated personnel respond to a chemical disaster. Only trained, first responders with safety equipment should enter the site. Other non-essential personnel could hamper, even nullify the rescue and containment efforts. Cooperation between response teams will deteriorate if channels of authority are left open to "eager volunteers" who assume that they are capable of making tough decisions that pertain to chemical disasters. All appropriate resources, e.g. Poison Control, Chemtreck, Pollution Control Agencies, etc., should be included in the planning in order to develop a cohesive decision making process. Unnecessary evacuation should be avoided as it overburdens holding facilities and generates mass hysteria, however, the decision to evacuate is critical and should be arrived at after swift appropriate deliberation.

Conclusion

Chemical disaster drills so far have been unheard of. By testing this system, the State of Minnesota is one step up in handling a chemical disaster. Planning and executing this kind of drill is expansive, difficult to organize and coordinate, and perhaps disruptive to the normal functioning of emergency rooms, hospitals, local businesses and industries. If successful, it can serve as a learning model to all other chemical accident sites throughout the State of Minnesota. This attempt of the State of Minnesota to develop a cohesive and flexible plan of coordination, cooperation, and communication will help the State be in a constant status of readiness for hazardous material accidents.

Acknowledgment

The authors acknowledge the contribution of Mr. Ed Jasinski from the Department of Public Safety, State of Minnesota, who was the State Exercise Training Officer. This article contains a few excerpts from the report, *"Twin Cities Metropolitan Area Hazardous Materials Exercise,"* Department of Public Safety, State of Minnesota.

Technical assistance in the preparation of this manuscript rendered by Michael Ales and Lolly Greeninger is gratefully acknowledged.

Acquired Immunodeficiency Syndrome

Serological Testing for HTLV-III Antibody

KENT CROSSLEY, M.D. and
MMA TASK FORCE ON AIDS[*]

Rather early on in the epidemic of acquired immunodeficiency syndrome (AIDS), it seems likely that the illness was caused by a transmissible agent. The endemiology of the disease, the recognition of contacts between cases and the selective depletion of OKT4+ lymphocytes suggested an infectious etiology. Investigators in Paris and in Bethesda identified an unusual virus in 1983-84 which seemed clearly associated with the occurrence of AIDS. French investigatorsnamed the virus lymphadenopathy-associated virus (LAV) while the National Institutes of Health referred to the virus as human T-cell leukemia (lymphotropic) virus-III (HTLV-III).

Isolation of the virus from clinical materials has proven to be a complex and difficult task. For this reason, evidence of infection with the virus is generally demonstrated by testing for HTLV-III antibody. In a general way, this is rather similar to diagnosing hepatitis B infection by use of serological tests rather than by directly culturing the virus.

Measurement of antibody to HTLV-III has shown that some 97% of patients with AIDS, and 91% of those with AIDS-related complex (ARC) are positive[1]. The prevalence of antibody in asymptomatic homosexual men has ranged between 20 and 70%[2,3]. Antibody prevalence in populations of intravenous drug abusers has varied from 1% to more than 50%[4]. In patients with hemophilia, the frequency of antibody positivity is between 40 and 75%[5]. In normal blood donors or in people with no known risk factors, the prevalence of a positive HTLV-III antibody is much less than 1%. Of nearly 120,000 recent volunteer blood donors in Minnesota, only eight men have had repeatedly positive tests[6].

Detection of HTLV-III antibody in the United States is done using two separate tests at the present time. An enzyme-linked immunoabsorbent assay (ELISA) is widely used as a screening test. This test is available in kit form from a number of manufacturers. Serum is placed in a small plastic well which has been coated with material from the HTLV-III virus. Following incubation, the serum is washed away. If antibody to the virus is present, it will have attached to the viral antigen in the well. An anti-human antibody conjugated to a color indicator is placed in the wells. The intensity of the color which develops is proportional to the quantity of antibody present in the patient's serum (Figure 1).

As used to screen blood donations, the ELISA test is very sensitive but not extremely specific. This, in part, is a result of an arbitrary decisions about what should be considered a reactive or nonreactive test. Because the test was designed principally to screen blood, the major goal was to develop a test which would miss (i.e., not detect) only a very rare donor infected with the HTLV-III virus. Thus, the ELISA test has been defined in such a way that false negatives are very rare while false positives are somewhat more frequent.

To further test for evidence of HTLV-III infection, a gel electrophoresis method (widely referred to as the "Western blot") is used (Figure 2). This test specifically looks for antibody to components of the AIDS virus. Most notably, these are proteins which are present within the core of the virus (designated as P24) or on its surface (referred to as GP41). Because the Western blot technique is more expensive and time consuming than the ELISA, it is principally used to confirm results which are positive by the ELISA technique. The ELISA test costs between $5.00 - $25.00 and the Western blot from $25.00 to $80.00.

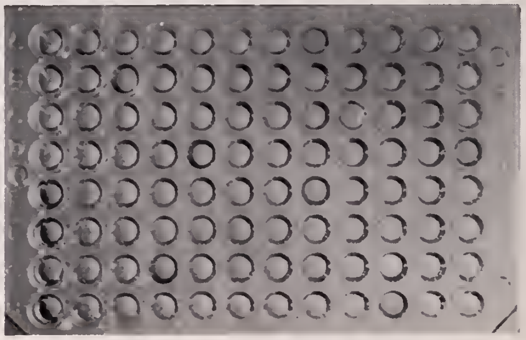

Fig. 1 - A microtiter plate demonstrating results of ELISA testing for HTLV-III antibody. Wells which appear darker in this photograph contain sera which has antibody present to the HTLV-III virus.

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[*] Members include: Mike Daly, M.D., Minneapolis; Mark Eckman, M.D., Duluth; Robert Gruninger, M.D., Minneapolis (Co-Chairman); Hanan Rosenstein, M.D., Minneapolis; Margaret Simpson, M.D., Minneapolis, Scott Strickland, M.D., Minneapolis; David Williams, M.D., Minneapolis and Kent Crossley, M.D., St. Paul (Chairman). Valentine O'Malley, M.D., and Michael Osterholm, Ph.D., M.P.H., are ex-officio members.

Individuals who have serum reactive by ELISA testing and by Western blot presumably have been infected with the HTLV-III virus. Evidence suggests that individuals who are asymptomatic but HTLV-III antibody positive can transmit infection. For example, a group of 25 blood donors implicated in cases of transfusion-associated AIDS were all found to be antibody positive. Yet only seven of this group had developed AIDS or AIDS-related complex[7]. Based on current knowledge, it seems reasonable to assume that all antibody positive individuals are potentially infectious.

A person who is a member of a high risk group but in good health with a negative antibody test is probably not infected with HTLV-III. There have, however, been situations in which virus has been recovered from high risk individuals who are seronegative[8]. Several Minnesota patients with AIDS-related complex (ARC) have been identified who are ELISA negative and Western blot positive. In patients who have apparent AIDS or ARC and are ELISA negative, it may be appropriate to order a Western blot. Although assumed to be a matter of weeks, it is unclear precisely how long it takes for antibody to develop following exposure to the virus. Presumably there is a period of time during which a person may be infected (and able to transmit the virus) but not yet seropositive.

Serologic tests have been employed to screen donated blood for nearly a year. It is too soon to have demonstrated a clear impact of screening and of voluntary deferral by members of high risk groups on the frequency of transfusion-associated disease, because of the lengthy incubation periof of HTLV-III infection. It is expected that transfusion-associated AIDS (which now accounts for about 2% of cases of AIDS in the United States) will become very uncommon in those transfused after screening was instituted in May 1985.

In situations other than screening blood donors, use of HTLV-III antibody testing is controversial. Three other areas in which the test has been utilized include: (1) as a technique to assess risk following needle-stick injury to a health care worker (see the April *Minnesota Medicine*), (2) as a way for individuals in high risk groups to learn whether or not they have been infected, and (3) as an adjunct to the diagnosis of HTLV-III-associated diseases.

Individuals in high risk groups (notably male homosexuals) are often interested in learning if they have been infected with the HTLV-III virus. This may be accomplished by having serologic testing obtained through a physician's office or clinic. However, having a test done in these circumstances does not ensure confidentiality or anonymity. Because of the profound implications of HTLV-III antibody positivity, many individuals are concerned that a positive HTLV-III antibody result in their medical record may have serious potential limitations on their future insurability or employment.

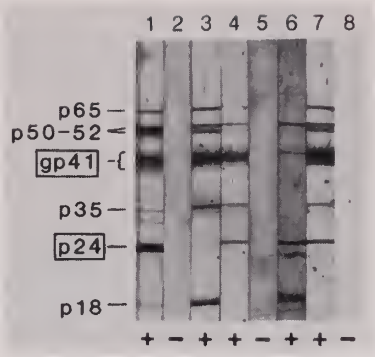

Fig. 2 - An example of a series of Western blots. The controls (and specimens 1, 3, 4, and 5) have bands at GP41 and P 24 which represent antibody to components of the AIDS virus.

Because of these concerns, the Centers for Disease Control encouraged the development of so-called "alternate test sites" to enable anonymous serological testing. Initial motivation for establishment of these centers was prompted by a desire to prevent a large number of high risk subjects from offering to donate blood as a way of learning their antibody status. Another rationale was the assumption that sexually active homosexual men might modify their behavior (and thereby reduce transmission of the virus) if they were aware of their HTLV-III antibody status. Alternate test sites in Minnesota at present include the Red Door Clinic in Minneapolis ([612] 347-3300), Room 111 of the St. Paul Division of Public Health ([612] 292-7752, Duluth Community Health Center ([218] 722-1497), Olmsted County Health Department in Rochester ([507] 285-8352) and Stearns County Community Health Services Quiet Care Clinic in St. Cloud ([612] 255-6155). Members of the MMA Task Force believe that, at the present time, serological testing is often most appropriately done at these sites.

Serological testing for HTLV-III antibody has been widely endorsed by public health officials who believe that test-based counseling may assist in effecting behavioral change. Studies to determine if this is true are in progress. Most national public health agencies and professional associations of public health officials support the policy that persons in high-risk groups should be offered testing, particularly if it can be done in an anonymous fashing

It is possible to construct a cogent argument that serologic testing is probably rarely indicated simply to learn one's antibody status. Firstly, there is little long-term data available to clearly identify the probabilities of possible outcomes associated with being antibody positive. The proportion of patients with AIDS in cohorts of individuals who have been antibody positive for a number of years continues to increase. Rather recently, data has become available indicating that the virus per se may cause significant effects in addition to acting on the immune system (e.g., CNS infection resulting in aseptic meningitis and dementia). Thus, we are in the unusual situation of being able to quite accurately identify HTLV-III infection but unable to clearly explain its meaning.

It can also be argued that—at least for those at high risk—*all* sexual encounters should avoid the exchange of body fluids. If one assumes that "safe" sexual practices are really the only appropriate ones at the present time, then one's serological status becomes unimportant. Two men who are serologically negative should exercise the same precautions as individuals who are unaware of their antibody status. This is appropriate because an individual may be infected and capable of transmitting the virus even though antibody negative.

The alternate test sites provide detailed counseling about the meaning of the HTLV-III antibody test and the reasons that it might (or might not be) appropriate for an individual. The Task Force believes that this same type of counseling is appropriate in physicians' offices, and informational material for distribution to patients and for use in counseling is available through the Minnesota Medical Association.

The third situation in which the antibody test may be useful is in evaluation and management of a patient in a high risk group who has clinical findings suggestive of an opportunistic infection (and, therefore, of AIDS). A patient who is at high risk for this disease and undergoing evaluation for lymphadenopathy or opportunistic infection perhaps ought to have serologic testing done as part of this evaluation. It is helpful clinically to know that a patient with lymphadenopathy is antibody positive. It clearly reduces the likelihood that the lymphadenopathy is the result of another disease process. Physician members of the Task Force feel that serologic testing to confirm infection with this virus is often worthwhile.

The other situation in which HTLV-III antibody testing is clearly indicated is in a women who is considering becoming pregnant. Because of the high risk of transmission of the infection to a child at the time of birth, it is recommended that women who are in high risk groups (sexual partners of homosexual or bisexual men, drug addicts, hemophiliacs, etc.) should have serologic testing before deciding to become pregnant. It is important that appropriate counseling about the implications of a positive test for a pregnant woman and her child take place when testing is done.

The statutes governing reportability of communicable diseases in Minnesota indicate that a positive HTLV-III antibody status is reportable. The majority of positive HTLV-III antibody tests are being reported to the Minnesota Department of Health at the present time. Clarification of the importance of reporting will be forthcoming soon from the Commissioners of Health Task Force on AIDS.

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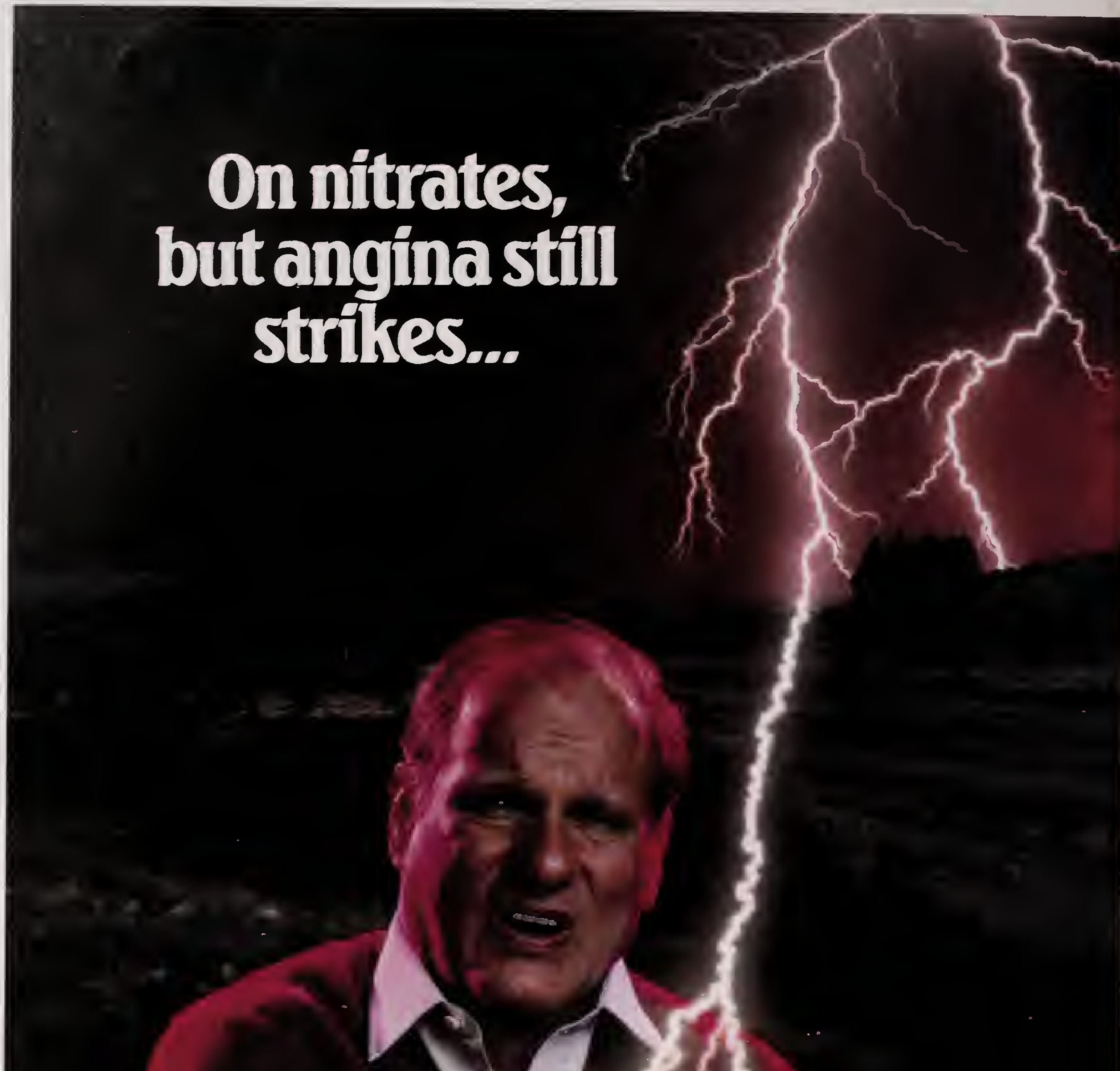
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Elevations of transaminases with and without concomitant elevations in alkaline phosphatase and bilirubin have been reported. Such elevations may disappear even with continued treatment; however, four cases of hepatocellular injury by verapamil have been proven by rechallenge. Periodic monitoring of liver function is prudent during verapamil therapy. Patients with atrial flutter or fibrillation and an accessory AV pathway (e.g. W-P-W or L-G-L syndromes) may develop increased antegrade conduction across the aberrant pathway bypassing the AV node, producing a very rapid ventricular response after receiving ISOPTIN (or digitalis). Treatment is usually D.C.-cardioversion, which has been used safely and effectively after ISOPTIN. Because of verapamil's effect on AV conduction and the SA node, 1° AV block and transient bradycardia may occur. High grade block, however, has been infrequently observed. Marked 1° or progressive 2° or 3° AV block requires a dosage reduction or, rarely, discontinuation and institution of appropriate therapy depending upon the clinical situation. Patients with hypertrophic cardiomyopathy (IHSS) received verapamil in doses up to 720 mg/day. It must be appreciated that this group of patients had a serious disease with a high mortality rate and that most were refractory or intolerant to propranolol. A variety of serious adverse effects were seen in this group of patients including sinus bradycardia, 2° AV block, sinus arrest, pulmonary edema and/or severe hypotension. Most adverse effects responded well to dose reduction and only rarely was verapamil discontinued. **Precautions:** ISOPTIN should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of excessive pharmacologic effects. Studies in a small number of patients suggest that concomitant use of ISOPTIN and beta blockers may be beneficial in patients with chronic stable angina. Combined therapy can also have adverse effects on cardiac function. Therefore, until further studies are completed, ISOPTIN should be used alone, if possible. If combined therapy is used, close surveillance of vital signs and clinical status should be carried out. Combined therapy with ISOPTIN and propranolol should usually be avoided in patients with AV conduction abnormalities and/or depressed left ventricular function. Chronic ISOPTIN treatment increases serum digoxin levels by 50% to 70% during the first week of therapy, which can result in digitalis toxicity. The digoxin dose should be reduced when ISOPTIN is given, and the patients should be carefully monitored to avoid over- or under-digitalization. ISOPTIN may have an additive effect on lowering blood pressure in patients receiving oral antihypertensive agents. Disopyramide should not be given within 48 hours before or 24 hours after ISOPTIN administration. Until further data are obtained, combined ISOPTIN and quinidine therapy in patients with hypertrophic cardiomyopathy should probably be avoided, since significant hypotension may result. Clinical experience with the concomitant use of ISOPTIN and short- and long-acting nitrates suggest beneficial interaction without undesirable drug interactions. Adequate animal carcinogenicity studies have not been performed. One study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. *Pregnancy Category C:* There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor and delivery only if clearly needed. It is not known whether verapamil is excreted in breast milk; therefore, nursing should be discontinued during ISOPTIN use. **Adverse Reactions:** Hypotension (2.9%), peripheral edema (1.7%), AV block: 3rd degree (0.8%), bradycardia: HR < 50/min (1.1%), CHF or pulmonary edema (0.9%), dizziness (3.6%), headache (1.8%), fatigue (1.1%), constipation (6.3%), nausea (1.6%), elevations of liver enzymes have been reported. (See *Warnings.*) The following reactions, reported in less than 0.5%, occurred under circumstances where a causal relationship is not certain: ecchymosis, bruising, gynecomastia, psychotic symptoms, confusion, paresthesia, insomnia, somnolence, equilibrium disorder, blurred vision, syncope, muscle cramp, shakiness, claudication, hair loss, macules, spotty menstruation. **How Supplied:** ISOPTIN (verapamil HCl) is supplied in round, scored, film-coated tablets containing either 80 mg or 120 mg of verapamil hydrochloride and embossed with "ISOPTIN 80" or "ISOPTIN 120" on one side and with "KNOLL" on the reverse side. Revised August, 1984 2385

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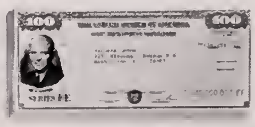

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Letters to the Editor

Dear Editor:

I welcome the opportunity to respond to the article in the December, 1985, issue of *Minnesota Medicine* by Richard Saunders, M.D.

I have been unable to document that a person by the name of Richard Saunders graduated from the University of Minnesota Medical School, was ever a participant in one of our residency programs, or was a member of either the voluntary or the full-time faculty. Nonetheless, in these complex and frequently troubling times for all persons practicing medicine, we must take careful stock of who we are and what we are doing regardless of whether our practice occurs in the private or academic sector.

We join all of the practitioners of medicine and all Minnesotans in recognition of and gratitude for the fact that our access to quality medical care is exemplary, and we at the University of Minnesota are pleased to have had major roles in creating this environment. We are dedicated to assuring the continuation of the highest standards through commitment to excellence in the implementation of our missions in research, education and provision of health care.

Problems in communication among the communities of physicians are undeniable and regrettable. We need to improve the quality and quantity of communication at both personal and institutional levels. We need to invite the input of all practitioners to the missions and programs of the Medical School and the University Hospital. As a representative of the Medical School I have communicated personally with several thousand practitioners throughout the State, seeking their input on several fronts. We are pleased with the changing attitudes of our faculty; they recognize the need to look beyond the "ivory tower" and to share with the non-University practitioners perceptions, reactions and ideas. We hope that others will share their thoughts with us while we attempt to create and promote positive relationships.

Where our faculty have deficiencies we are seeking to strengthen our leadership, and we have sought involvement of the practicing community with critical decisions and choices. We continue to try to create ideal role models with leaders who are solid teachers, scholars and practitioners in each of those areas. We are convinced that in most medical disciplines our faculty represent excellence in practice. An outstanding teacher of clinical medicine should be a scholar, and research strengthens that dimension of his/her role. It is extremely difficult to be Renaissance persons—it may be impossible in some instances. But there is no getting around the desirability of that goal, and we are seeking it without new appointments. The faculty does not intend to, and does not need to, "put down" anyone while speaking positively and enthusiastically about goals and accomplishments at the University. It is very exciting to be a part of the satisfaction of contributing to new knowledge and to the translation of that knowledge to medical care and education. We hope to share what we learn with our colleagues in both formal and informal settings, particularly at the bedside and in the old-fashioned conferences where we join together to exchange our wonderment and limited understanding. This is truly a two-way street. No one is a fountain of knowledge, regardless of where he/she happens to work.

We have established many forums for dialogue and have a regular meeting time with more than eighty community practitioners whom we have asked to share with us their feelings and concerns. They have responded frankly and graciously, and we welcome increased participation. The University of Minnesota Hospital, through its Board of Governors who are chosen by the Regents of the University to represent the public, welcome the comments and concerns of all interested parties in the programs conducted by the Hospital.

The University of Minnesota Hospital provides services to patients just like any other Minnesota hospital. On the other hand, the Hospital serves a unique role as the core teaching and research site for the Medical School and Health Sciences, and as a referral site for physicians across the State and indeed throughout the country. The very competitive environment among health plans, hospitals, and medical groups has become a way of life as each seeks to attract the attention of the people of the State by advertising via every available means. The Hospital felt the need to make clear its presence and accessibility in the midst of this media-saturated environment, and make every effort to be available to all the people of the State regardless of which health plan they choose to join.

While the similar and unique characteristics of the Hospital are recognized in a general way by everyone in the State, there has been a reluctance of health care plans to consider incremental costs which may be associated with the core teaching facility activities. Rather, the issues have centered only on the cost of providing service. When asked to compete in this type of price-sensitive competitive environment we must make sure that our presence and availability remain clear in the minds of the doctors and people of the State. They should be able to use our facility regardless of insurance carrier.

It will be difficult for the University to define *the* appropriate medical care system in this rapidly changing environment. One way to approach the problem is to provide the best educational milieu for all levels of our student body. Furthermore, we are wrestling with the problem of providing an optimal primary care teaching environment. It is important to emphasize that we are proud of the 1,954 voluntary faculty who participate in these programs despite their own busy schedules; we are pleased with the role models they represent for our students. They typify the classical image of physician as teacher. One can never say often enough or loudly enough, "*Thank you* for the excellent job and for your dedication to the profession."

We will continue to seek to perpetuate and to warrant the fine reputation for outstanding education, research and patient care which the State and the Region have come to expect from the Medical School and the University Hospital. These objectives can only be achieved through the active involvement and support of our past students and colleagues in medicine. It is clear that we are opening lines of communication that never were open before. It is never too late, nor is it wrong, to recognize that we are far from perfect; and we are never beyond trying to improve.

David M. Brown, M.D.
Dean
Professor, Laboratory Medicine
and Pathology and Pediatrics
University of Minnesota

Dear Editor:

Nadine (Ide) Smith sent me a copy of the editorial (Doctors Journey, Ruminations on Town and Gown) in Minnesota Medicine in December, 1985. I wanted to thank Saunders for the kind things he said about dermatology's good relationships with the "town" during my tenure as Head of the Department. Of course, I can't claim full credit for that happy state of affairs, although I worked hard at it. The reasons for it were several: first, I inherited a good situation from Francis Lynch and Henry Michelson before him. Another think was the relatively late transition from a department with no full-time faculty in which all teaching was the responsibility of practitioners contributing their time and talents. Finally, I think it helped me to have been in a downtown private practice for 15 years before going full-time academic in 1964. That background gave me some perspective on and sympathy for the views of the practicing doctors that those who have always been academic may not share.

As you well know, there has always been some town/gown antagonism in every medical school and probably always will be. You may remember that the late greats, Owen Wangensteen and Cecil Watson, were not always loved. Part of the problem brought out so well in the article traces to the somewhat schizophrenic position of full-time faculty. They are supposed to be doing meaningful research and investigation while at the same time being model teachers and clinicians. This is an almost impossible task for most of us non-"Renaissance men," particularly since research has become so specialized and often so far separated from the mainstream of medical practice. I don't know what the solution is, but Saunders' ideas of recruitment of a separate line of faculty whose primary responsibility lies in patient care and clinical teaching may be the only way to go. It is being discussed and being tried in varying degrees in almost every medical school in the country.

I'm sure you are well aware that the University is "running scared" (as is everyone else!) in regard to its future ability to attract enough patients, to carry out its teaching and research responsibilities as well as to meet the payroll. I suppose that is the reason for its P.R. efforts and the advertising. I do hope that you and the other men and women of the town will continue to try to empathize with some of its very real problems and its maybe sometimes abrasive ways of trying to deal with them. As said in the editorial, certainly the people of Minnesota and all its doctors do need to have a top-rank medical school based on a healthy teaching hospital.

As you see, I am now on the faculty here at U.C. San Diego, and am enjoying not only the climate, but also doing what I enjoy most—seeing patients and teaching. I don't miss the administrative headaches of being a department chairman one bit! I'm incredibly lucky to have found the niche to slide into instead of going into full retirement abruptly.

Again, let me congratulate you on this perceptive and straight forward editorial and thank Saunders again for the kind words he included about the Department of Dermatology. I hope you won't mind if I send a xerox of this letter to Nadine Smith and to Ed Schwartz at the University Hospitals.

Robert W. Goltz, M.D.
University of California, San Diego

Dear Editor:

Polarization of the Town and Gown

The Rural Physician Associate Program (RPAP) is helping rural physicians alleviate physician maldistribution, geographical and educational isolation, and providing a broad base of clinical primary care teaching for undergraduate and postgraduate students.

"Dr. Richard Saunders" a pseudonym for a physician who has experience both in the practice of medicine from the faculty (gown) and the (town) metropolitan community side, expresses some very lucid comments about the polarization of the "town and gown." My understanding is this is a real live physician who wrote the remarks to the *Minnesota Medicine* editors for publication and is presently practicing medicine "in the town" (metropolitan area) and for "many years was a member of the University of Minnesota Medical Center full-time faculty." Conversely, I was in private practice in outstate Minnesota since graduation from the University of Minnesota Medical School in 1948, and I am now (since 1969) a full-time faculty member in this same university. I have experienced both sides too, Dr. Saunders, and I'm encouraging you and all your colleagues to "take heart" and help us at the "U." Granted there may be animosity between "town and gown," and my experience gave me some of the same feelings you expressed in *Minnesota Medicine* in the December, 1985 issue. However, the first five items in regards to training doctors, teaching young people how to "doctor," proper role models, paucity of Renaissance Men, town-gown animosity, etc. may be present, but we do have many of the outstanding physician (Bob Good) models you mentioned (approximately 120 per year) who do what you suggest they need to do.

The Rural Physician Associate Program (RPAP) was mandated by you and all the citizens of the state through the State Legislature in 1970 when the House Appropriation Committee chairman told us in the Mayo Auditorium we needed to have a medical education program in place in the next two years to redistribute physicians in the needy rural areas of our state, or be faced with removal of all state funding to the Medical School! This was no joke - I heard it. (We almost lost our soul then.) The Medical School faculty responded. Each year, 120 or more of our University faculty visit our junior medical students, their outstanding practicing physician tutors (working with the student for nine to 12 months and the students receiving academic credit for this effort), other helping professionals in the rural community, spending two-thirds of a full day teaching, free consultations, and aiding the helping professionals (including students, physicians, nurses, therapists, technicians, etc.) with numerous clinical problems. Over 3000 of these visits have been made in the past 15 years of RPAP's existence. The practicing physicians receive continuous medical educational credits for these events if they wish to do so, and many do. Same is true for the nurses, therapists, technicians working in the community if they wish to apply for educational credit. Over 500 physicians and literally thousands of other helping professionals in 91 of the 160 rural hospital communities have been doing this on an ongoing basis. Our tutors (over 500 of them) average 15+ years of practicing medicine have taught over 600,000 hours to our students, and have given over two million dollars in stipends to the students with no legal or formal commitment to go back to rural Minnesota. Yet, the majority of them are going back, and we can now say, at this printing time, that all 87 counties in Minnesota have an acceptable ratio of physicians by our medical society standards. Very few states in the union can claim this.

The linkage and outreach is a very positive spin-off of the RPAP Program, and the outstanding support of your colleagues in rural Minnesota and the medical school faculty. Professional and personal isolation melts away as consultative, teaching support, and referral relationships are established with the University faculty. I urge you to read the details and review the tables in the articles of the numerous beneficial effects the RPAP effort has had for the physicians in rural Minnesota.[1,2] The village (town) and gown already are working together in a most unique fashion, unbeknown to any other state I know of in the U.S.A. We are involved in working together in rural Minnesota, helping physicians and students with their clinical problems. We are teaching and helping, and we are learning much from you and your colleagues.

We are making medical education exciting.[3-6] Our RPAP educational research has revealed the ability to significantly modify practicing physicians' interpersonal relationships with patients.[6] We are helping the medical student, physician, and the tutor to see themselves as the patient sees them in audiovisually taping with the patients in their communities (over 3000 events in 15 years).[7] We're teaching the medical student that on numerous occasions, the wrong patient may present with complaints. It may be a sick family or community. Marriage counselors and family therapists help in giving students insight into this phenomenon.

Our RPAP educational research mentioned in references 3, 4, 5, 6, and 7 reveals how the people's medical school clinical faculty of 1,954 voluntary faculty (over 500 in rural Minnesota) and the University faculty are supporting and helping to resolve some of the problems we all face in caring for people.

I agree with you in your asking for a win-win proposition. Why not start the RPAP in the metropolitan areas of our state? I'm willing if you are!

John E. Verby, M.D.
Director Rural Physician Associate Program, and
Professor Department of Family Practice and Community Health

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Dear Editors:

As much as I appreciate the depth of thought in your address that was published in *Minnesota Medicine*,* I would like to correct the reference to the Minnesota Health Network as it relates to the association with Med Centers Health Plan.

Minnesota Health Network has a contract with MedCenters Health Plan to provide care under what is known as Plan 100. Minnesota Health Network also is under contract to provide care for Fireman's Fund under what is being marketed as Fund Care. The physicians of Minnesota Health Network, through their Board, have a commitment to make every effort to develop a more intregrated system of health care delivery under the MedCenter Health Plan umbrella. We are committed to addressing greater efficiency in medical care as a product of quality enhancement and cost containment. It should be clear to our membership, however, that this is not an acquisition by MedCenters Health Plan, and their relationahip with the independent stature of Minnesota Health Network has not been altered.

Richard Frey, M.D.
Chairman
Minnesota Health Network
Minneapolis, Minnesota

Dear Editor:

I would like to respond to Dr. Dorsen's excellent summary of the causes of anemia in endurance athletes, particularly runners. I feel this review was excellent and appropriate. I would, however, like to extend this discussion by adding an additional one or two paragraphs to summarize the problem commonly occurring in endurance athletes of iron deficiency *without* anemia.

If one is considering the definition of anemia to be a subnormal hemoglobin, there have been many reports in the literature of sports medicine as well as my own anecdotal experience of endurance athletes, particularly runners, with normal hemoglobins but low serum ferritins. An excellent review in a recent issue of "Sports Medicine" showed that performances in runners and other endurance athletes were subnormal when serum ferritin dropped below a level of 64[1], whereas, the normal for the male is a level above 20 ng/ml and the female levels abovet 10 ng/ml. These situations have occurred even in those with normal hemoglobins. Since serum ferritin reflects tissue iron stores, depletion of tissue stores can affect performance. The review I just cited also suggested that iron supplementation should be performed to keep levels for both male and female endurance athletes above a level of 64 to best ensure optimal performance.

My anecdotal experience has also supported this finding. At one point in my marathon training I had difficulty in recovering from a marathon. Subsequent testing revealed a normal hemoglobin of 14.7 but a serum ferritin of 18, upon replenishment with therapeutic doses of ferrous sulfate and ascoibic acid, I was able to raise my serrum ferritin over the course of 12-15 months to a level of 135. Within less that a month of iron therapy, however, the symptoms of fatigue and difficulty with training resolved. This has been the experience also with elite athletes as well as recreational athletes. Both men and women are susceptible to this. I caution the physician examining the endurance athletes to consider performing a serum ferritin if symptoms consistent with anemia are present but the hemoglobin is normal.

This has also occurred in cross country skiers, cyclists, and swimmers but to a lesser degree than that occurring in distance runners.

I would also amend Dr. Dorsen's recommendation with the idea of monitoring serum ferritin periodically while training if endurance training remains consistent over the course of one's life.

---

*Editor's Notebook. Minnesota Medicine 69:1:7, 1986.

Robert J. Johnson, M.D.
Primary Care Sports Medicine
Department of Family Practice
Hennepin County Medical Center

Reference

1. Clement, DB and Sawchuk, LL: Iron Status & Sports Performance. Sports Medicine Adis Press 1:65-74, 1984.

Dear Editor:

The significance of a normal hemoglobin but a low serum ferritin seems especially important as a precursor of an anemia. Clement and Sawchuk hypothesize that a reduction in work capacity in athletes who have iron deficiency without anemia is due to decreased concentration of myoglobin and iron-containing enzymes important in energy production. Such individuals have demonstrated excess lactate production.[1] Schoene et al. propose that iron depletion in female athletes with mild anemia might effect exercise performance and lactate generation during maximal exercise.[2] Plowman and McSwegin emphasize that in fact hemoglobin may be the last entity effected by a negative iron balance. They did not, however, discuss the effect of iron supplementation on performance in their female athletes.[3]

Defaux et al. found free hemoglobin in plasma of middle and long-distance runners, a fall in haptoglobin-plasma concentration, and haptoglobin-hemoglobin complexes removed from the blood by the liver. These authors found low ferritins and recommended administering iron if a manifest or latent iron depletion has been diagnosed.[4]

Hallberg and Magnusson refute my contention that endurance athletes even become anemic for any of the reasons stated in my recent anecdotal paper. They presumably would reject Doctor Johnson's premise as well that normal hemoglobins associated with low serum ferritins could produce suboptimal performances. These authors contend it is impossible for young, healthy athletes with high dietary intake of essential nutrients including iron to become iron deficient. They describe lowered serum ferritin levels but attribute the lower serum iron levels, reduced bone marrow hemosiderin, and ferritin to a shift in iron metabolism.

They see no rational basis for the routine extra supply of iron to athletes. They contend that the slightly increased intravascular hemolysis from such "unphysiological endurance sports" leads to an increased formation of the hemoglobin-haptoglobin complexes which in turn are taken up by the hepatocytes. This process in turn reduces the uptake of dying red cells by the reticuloendothelial system with a reduction in the concentration of ferritin and transferrin-bound iron in plasma and a reduction of stainable iron in the reticuloendothelial cells of the bone marrow.

Another explanation physiologically for such anemias in endurance athletes according to Hallberg and Magnusson are ambient elevations of 2,3 DPG which shifts the oxygen dissociation curve to the right with an increased delivery of oxygen to the tissues, decreasing the stimulus for erythropoietin. They contend this sets the hematocrit and hemoglobin at a lower level.[5] A recent *Lancet*editorial stated that although the minor changes in hematocrit are much more likely to represent a physiological response to unphysiological exercise and not a true reduction in total body hemoglobin, iron therapy should be restricted to those patients with unequivocal evidence of subnormal iron supply for erythropoiesis.[6]

I continue to advocate periodic hemoglobin and ferritin evaluations, especially in endurance athletes, to accurately diagnose early anemias and thus treat with hematinics and optimize sports performance.

Peter J. Dorsen, M.D.
Minneapolis, Minnesota

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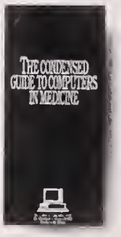

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MMIE Malpractice Claim Review

Internal Medicine

MMIE RISK MANAGEMENT COMMITTEE;
FRANK E. JOHNSON, M.D.,
CHAIRMAN

Allegation

Failure to diagnose symptoms of myocardial infarction and lack of informed consent.

Facts

The patient, a 74-year-old male, had been seen at the clinic since 1972 primarily for control of his hypertension. Dr. X first saw the patient on May 16, 1983 for a routine physical examination which included a cardiogram which showed no significant change from the one taken a year previously. On July 12, 1983 the patient returned to the clinic because of peripheral edema, fatigue, and nausea. Two days later he was admitted for evaluation of an elevated BUN, Creatinine, and Sed rate. After catheterization the patient's kidney function studies began to improve, and he was discharged with a catheter for a contemplated TUR in the future.

When the patient was seen by Dr. X's partner on July 26, 1983 for a routine, post-hospital exam, he complained of much shoulder distress the prior evening. The shoulder pain was thought to be suggestive of a bursitis which the patient had complained of in the past. Lab tests were ordered to monitor the patient's anemia and uremia. Included in the battery of tests were cardiac enzyme studies which were reported as markedly abnormal, but overlooked by the physician.

On August 15th the patient was seen again by Dr. X with continuing complaints of left shoulder pain. Because of the ongoing nature of his complaints, the patient was referred to physical therapy for Codman exercises. Kidney function studies showed continued improvement.

On August 22, 1983 the patient was readmitted to the hospital for a Cysto and TUR. The surgery and postoperative course were uneventful except for continued complaints of shoulder pain. No EKG was taken during this hospitalization.

Postoperatively the patient was followed by the surgeon and did not present to Dr. X again until October 24, 1983. Just prior to that visit, the physical therapist suggested to Dr. X that the patient's shoulder pain may be of cardiac origin based on the history he was now giving which included a two year history of upper chest pain and tightness, exacerbated by physical and emotional stress. Dr. X concluded that the patient needed a more extensive work-up and scheduled him for a stress test on November 2, 1983.

Prior to beginning the stress test, an EKG was taken which was highly abnormal suggesting ischemia but no infarct. In view of the disparity between the patient's symptoms and his highly abnormal EKG, Dr. X decided to proceed with the stress test to evaluate the patient's activity level. Although an authorization was signed, no risks and complications were discussed with the patient. After starting the test, the patient's color deteriorated rapidly, his heart rate increased, and his blood pressure dropped. The test was terminated after 2 minutes and 34 seconds. The patient denied any chest pain during the testing.

Following the testing, the patient's color improved and his vital signs returned to normal. Dr. X discussed the results of the stress test with the patient, prescribed medication, and asked him to return in one week. After approximately 30-45 minutes the patient left the clinic. Moments after leaving, the patient's wife returned and told the nurse her husband was not feeling well. The nurse escorted the patient back into the clinic where he arrested. Despite aggressive measures, the patient could not be resuscitated. An autopsy revealed an acute myocardial infarction and two previous infarcts.

Disposition

After negotiations with the claimant's attorney, this case settled for $80,000.

Reason for Settlement

The claimant's attorney disclosed an expert opinion that the patient suffered an acute MI in July of 1983 that was not diagnosed and treated by Dr. X. In addition, the expert stated that in view of the markedly abnormal pre-stress EKG, the tread-mill stress test should not have been done, or at the very least, should have been done in a hospital setting.

Risk Management Comments

1. Many malpractice cases arise because abnormal lab and X-ray results are overlooked by the physician resulting in delays in diagnosis and treatment. This is particularly a problem when a patient is seen by a covering partner who may never see the patient again. In this case, the abnormal cardiac enzyme results were not discovered until after the malpractice claim had been presented. Because he

did not review the lab results, the physician was unable to completely assess the patient's condition. It is essential that clinics develop systems to ensure that all reports are reviewed by a physician and the results communicated to the patient.

2. Patients may not always recognize the significance of their symptoms or accurately report the severity and duration of those symptoms, particularly when the problem has been present for a long period of time. Physicians and nurses must take the time to obtain a complete history including the duration, severity and nature of the symptoms. Once a diagnosis is made and treatment initiated, the patient's response must be monitored. If the treatment is not producing the desired results, further testing should be conducted.
3. Another issue in the settlement of this case was lack of informed consent. Many physicians feel that the patient's informed consent need be obtained only when a surgical procedure is performed. However, Minnesota law specifically states that the patient must be informed by the physician of the risks, benefits, and alternatives prior to undergoing any test or procedure which involves significant risk. A stress test is such a procedure.

Ninth Annual Black Hills Seminar

The Ninth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 18, 19 and 20, 1986, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include: Drs. James Corrigan, Jerome Klein, George Little, and Lynn Taussig. For complete conference information contact:

Lawrence R. Wellman, M.D.
Program Coordinator
USD School of Medicine
1100 S. Euclid, P.O. Box 5039
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Harold A. Diehl Award

The Committee for the Diehl Award given annually by the University of Minnesota Medical Alumni Society solicits nominations for this award from the physicians of Minnesota. The Diehl Award is presented to one or more physicians meeting these four major criteria:

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Not engaged in an academic capacity.

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Has had a relatively long experience in the field of medical science or a related field.

Nominations for the June 1986 awards should be mailed to:

N. L. Gault, Jr., M.D., Chairman
Harold A. Diehl Award Committee
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Nominations should be supported by documentation of nominee's qualifications or a list of the sources where the Committee can obtain such information.

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*Cardizem is indicated in the treatment of angina pectoris due to coronary artery spasm and in the management of chronic stable angina (classic effort-associated angina) in patients who cannot tolerate therapy with beta-blockers and/or nitrates or who remain symptomatic despite adequate doses of these agents.

References:
1. Strauss WE, McIntyre KM, Parisi AF, et al: Safety and efficacy of diltiazem hydrochloride for the treatment of stable angina pectoris: Report of a cooperative clinical trial. Am J Cardiol 49:560-566, 1982.
2. Pool PE, Seagren SC, Bonanno JA, et al: The treatment of exercise-inducible chronic stable angina with diltiazem: Effect on treadmill exercise. Chest 78 (July suppl):234-238, 1980.

PROFESSIONAL USE INFORMATION

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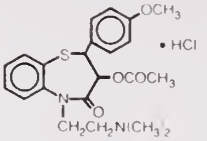
DESCRIPTION

CARDIZEM® (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist) Chemically, diltiazem hydrochloride is 1,5-Benzothiazepin-4(5H)one,3-(acetyloxy)-5-[2-(dimethylamino)ethyl]-2,3-dihydro-2-(4-methoxyphenyl)-, monohydrochloride,(+)-cis-. The chemical structure is:



Diltiazem hydrochloride is a white to off-white crystalline powder with a bitter taste. It is soluble in water, methanol, and chloroform. It has a molecular weight of 450.98 Each tablet of CARDIZEM contains either 30 mg or 60 mg diltiazem hydrochloride for oral administration.

CLINICAL PHARMACOLOGY

The therapeutic benefits achieved with CARDIZEM are believed to be related to its ability to inhibit the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle

Mechanisms of Action. Although precise mechanisms of its antianginal actions are still being delineated, CARDIZEM is believed to act in the following ways:

1. Angina Due to Coronary Artery Spasm. CARDIZEM has been shown to be a potent dilator of coronary arteries both epicardial and subendocardial. Spontaneous and ergonovine-induced coronary artery spasm are inhibited by CARDIZEM.
2. Exertional Angina: CARDIZEM has been shown to produce increases in exercise tolerance, probably due to its ability to reduce myocardial oxygen demand This is accomplished via reductions in heart rate and systemic blood pressure at submaximal and maximal exercise work loads.

In animal models, diltiazem interferes with the slow inward (depolarizing) current in excitable tissue. It causes excitation-contraction uncoupling in various myocardial tissues without changes in the configuration of the action potential. Diltiazem produces relaxation of coronary vascular smooth muscle and dilation of both large and small coronary arteries at drug levels which cause little or no negative inotropic effect. The resultant increases in coronary blood flow (epicardial and subendocardial) occur in ischemic and nonischemic models and are accompanied by dose-dependent decreases in systemic blood pressure and decreases in peripheral resistance.

Hemodynamic and Electrophysiologic Effects. Like other calcium antagonists, diltiazem decreases sinoatrial and atrioventricular conduction in isolated tissues and has a negative inotropic effect in isolated preparations In the intact animal, prolongation of the AH interval can be seen at higher doses

In man, diltiazem prevents spontaneous and ergonovine-provoked coronary artery spasm. It causes a decrease in peripheral vascular resistance and a modest fall in blood pressure and, in exercise tolerance studies in patients with ischemic heart disease, reduces the heart rate-blood pressure product for any given work load Studies to date, primarily in patients with good ventricular function, have not revealed evidence of a negative inotropic effect, cardiac output, ejection fraction, and left ventricular end diastolic pressure have not been affected. There are as yet few data on the interaction of diltiazem and beta-blockers. Resting heart rate is usually unchanged or slightly reduced by diltiazem

Intravenous diltiazem in doses of 20 mg prolongs AH conduction time and AV node functional and effective refractory periods approximately 20%. In a study involving single oral doses of 300 mg of CARDIZEM in six normal volunteers, the average maximum PR prolongation was 14% with no instances of greater than first-degree AV block Diltiazem-associated prolongation of the AH interval is not more pronounced in patients with first-degree heart block. In patients with sick sinus syndrome, diltiazem significantly prolongs sinus cycle length (up to 50% in some cases).

Chronic oral administration of CARDIZEM in doses of up to 240 mg/day has resulted in small increases in PR interval, but has not usually produced abnormal prolongation. There were, however, three instances of second-degree AV block and one instance of third-degree AV block in a group of 959 chronically treated patients.

Pharmacokinetics and Metabolism. Diltiazem is absorbed from the tablet formulation to about 80% of a reference capsule and is subject to an extensive first-pass effect, giving an absolute bioavailability (compared to intravenous dosing) of about 40%. CARDIZEM undergoes extensive hepatic metabolism in which 2% to 4% of the unchanged drug appears in the urine. In vitro binding studies show CARDIZEM is 70% to 80% bound to plasma proteins. Competitive ligand binding studies have also shown CARDIZEM binding is not altered by therapeutic concentrations of digoxin, hydrochlorothiazide, phenylbutazone, propranolol, salicylic acid, or warfarin Single oral doses of 30 to 120 mg of CARDIZEM result in detectable plasma levels within 30 to 60 minutes and peak plasma levels two to three hours after drug administration The plasma elimination half-life following single or multiple drug administration is approximately 3.5 hours Desacetyl diltiazem is also present in the plasma at levels of 10% to 20% of the parent drug and is 25% to 50% as potent a coronary vasodilator as diltiazem Therapeutic blood levels of CARDIZEM appear to be in the range of 50 to 200 ng/ml. There is a departure from dose-linearity when single doses above 60 mg are given, a 120 mg dose gave blood levels three times that of the 60-mg dose. There is no information about the effect of renal or hepatic impairment on excretion or metabolism of diltiazem

INDICATIONS AND USAGE

1. **Angina Pectoris Due to Coronary Artery Spasm**. CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm. CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks)
2. **Chronic Stable Angina (Classic Effort-Associated Angina).** CARDIZEM is indicated in the management of chronic stable angina. CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance.

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited Caution should be exercised when using the drug in such patients
3. **Hypotension**. Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension
4. **Acute Hepatic Injury.** In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes. (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM (See WARNINGS).

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates There was an increased incidence of stillbirths at doses of 20 times the human dose or greater

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation

Pediatric Use. Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%), AV block (1.1%). In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence.

Cardiovascular:	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope.
Nervous System:	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia.
Gastrointestinal:	Constipation, dyspepsia, diarrhea, vomiting, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH.
Dermatologic:	Pruritus, petechiae, urticaria, photosensitivity
Other.	Polyuria, nocturia

The following additional experiences have been noted.

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: erythema multiforme; leukopenia, and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited. Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers. In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage. The following measures may be considered.

Bradycardia	Administer atropine (0.60 to 1.0 mg). If there is no response to vagal blockade, administer isoproterenol cautiously.
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg, dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral/LD_{50}'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively. The intravenous LD_{50}'s in these species were 60 and 38 mg/kg, respectively. The oral LD_{50} in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity

DOSAGE AND ADMINISTRATION

Exertional Angina Pectoris Due to Atherosclerotic Coronary Artery Disease or Angina Pectoris at Rest Due to Coronary Artery Spasm. Dosage must be adjusted to each patient's needs Starting with 30 mg four times daily, before meals and at bedtime, dosage should be increased gradually (given in divided doses three or four times daily) at one- to two-day intervals until optimum response is obtained Although individual patients may respond to any dosage level, the average optimum dosage range appears to be 180 to 240 mg/day. There are no available data concerning dosage requirements in patients with impaired renal or hepatic function. If the drug must be used in such patients, titration should be carried out with particular caution

Concomitant Use With Other Antianginal Agents:

1. **Sublingual NTG** may be taken as required to abort acute anginal attacks during CARDIZEM therapy
2. **Prophylactic Nitrate Therapy**—CARDIZEM may be safely coadministered with short- and long-acting nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.
3. **Beta-blockers.** (See WARNINGS and PRECAUTIONS.)

HOW SUPPLIED

Cardizem 30-mg tablets are supplied in bottles of 100 (NDC 0088-1771-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1771-49). Each green tablet is engraved with MARION on one side and 1771 engraved on the other. CARDIZEM 60-mg scored tablets are supplied in bottles of 100 (NDC 0088-1772-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1772-49). Each yellow tablet is engraved with MARION on one side and 1772 on the other

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For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

MARCH, 1986

15-22 **Symposium on Health Care for the Elderly**; Minnesota Medical Association; Kauai Hilton, Kauai, HI. CONTACT: Eugenia C. Kassar, MMA, 2221 University Ave. S.E. - Suite 400, Minneapolis, MN 55414. 612/378-1875.

15-22 **The Challenge of Change: Emerging Images in Clinical Practice** Wilderness Learning Institute; Huntley Lodge, Big Sky, Montana. CONTACT: Diane Campbell, 4600 Park Avenue South, Minneapolis, Minnesota 55407. 612/ 824-9074.

17-18 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

17-19 **Urology Update** Mayo Clinic/Mayo Foundation; Sawgrasss Resort, Ponte Vedra Beach, FL. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/ 284-2085.

21-22 **Borderline Syndrome in Children** Abbott Northwestern Hospital; Hyatt Regency, Minneapolis. CONTACT: Sarah Ventres, CME Coord., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461

21-22 **Seventh Annual Update:** Occupational Medicine. St. Paul-Ramsey Medical Center; Holiday Inn-Town Square. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

26 **Hypertension Symposium** CME, Medical School, University of Minnesota; 2-690 Moos Tower, University of Minnesota, Minneapolis. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373/8012.

APRIL, 1986

3 **Innovations in Oncology** EME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

4 **Duluth Heart Conference** The Duluth Clinic, Ltd.; Fitger "Spirit of the North" Theater, Duluth; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

4-5 **Eye Enucleation** CME, Medical School, University of Minnesota; 2-155 Jackson Hall, University of Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota. 55455. 612/373/8012.

5 **Symposium on the Dementias-Pathology** Minnesota Society of Clinical Pathologists; Radisson Metrodome, Minneapolis. CONTACT: Pam Lindberg, MSCP, 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

5 **Minnesota Society of Anesthesiologists Spring Scientific Meeting** Minnesota Society of Anesthesiologists; Marriott, Bloomington, Minnesota. CONTACT: Peter A. Southorn, MBBS, 200 First Street Southwest, Rochester, Minnesota 55905. 507/286-8766.

7-8 **Treatment of Families in Sexual Crisis Series: Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

10-11 **Gynecology Update** St. Paul-Ramsey Medical Center; Holiday Inn-Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

11-12 **9th Annual Update in Practical Cardiology** Abbott Northwestern Hospital, Abbott Northwestern Hospital. CONTACT: Sarah Ventres, Ed. Dept., Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-4300.

11-12 **Colon and Rectal Diseases in Primary Care** CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 **Current Concepts in Refractive Surgery** CME, Medical School, University of Minnesota; Holiday Inn Downtown, Minneapolis; CONTACT: Office of CME, University of Minnesota, Box 293 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/ 373-8012.

17-20 **Migrant Health Conference** CME, Medical School, University of Minnesota; Amfac Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

18 **ENT Update** St. Joseph's Hospital; 69 West Exchange Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

22 **Teleconference on Anesthetics** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, University of Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

22-26 **Workshop on Fine Needle Aspiration Cytology** CME, Medical School; E.T. Bell Institute, 2-116 Moos Tower, University of Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

(April continued)

24-25 **Pediatric Days** Mayo Clinic/Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayio Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

24-25 **Detection and Diagnosis of Substance Abuse in Patients** St. Paul-Ramsey Medical Center; Wilder Forest, Stillwater, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

25 **Clinical Oncology for Primary Care Physician** St. Joseph's Hospital; Scheffer Auditorium, 69 West Exchange Street, St. Paul, Minnesota. CONTACT: James Giefer, M.D., St. Joseph's Hospital, 69 West Exchange Street, St. Paul, Minnesota 55101. 612/291-3100.

26 **Minnesota Urological Society Spring Seminar** Minnesota Urological Society; Landmark Center, St. Paul, Minnesota. CONTACT: Thomas A. Love, M.D., 737 Doctors Professional Building, St. Paul, Minnesota 55102. 612/224-7543.

26 **Problems in Acute Pediatric Care** The Duluth Clinic, Ltd.; The Duluth Clinic, Ltd., 400 E. Third Street, Duluth, Minnesota 55805. 218/722-8364.

27-30 **Treating the Juvenile Sexual Abuse Perpetrator: A National Training Conference; Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

28-May 2 **Family Practice Review: Update 1986** CME, Medical School, University of Minnesota; Radisson St. Paul Hotel, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

April 28-May 2 **Practice of Internal Medicine** Mayo Clinic, Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

April 30-May 2 **133rd Annual Meeting & Scientific Program** Minnesota Medical Association; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Eugenia C. Kassar, Director, Department of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

MAY, 1986

2-3 **Genetics Counseling for the Primary Care Physician** Abbott Northwestern Hospital; Registry Hotel, Bloomington. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

7-9 **World Med 1986: International Health Care Congress** CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

7-9 **44th Annual Course in Allergy and Clinical Immunology** CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

10 **Innovations in Allergy and Immunology** CME, Medical School, University of Minnesota; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 **Human Aging IX: Health Maintenance and Wellness;** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

15 **Changing Profiles in Clinical Toxicology.** St. Paul-Ramsey Medical Center, Hennepin County Medical Center, Minneapolis. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

20 **Symposium on Gynecologic Oncology** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21-23 **Current Concepts in Radiation Therapy** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

30-31 **Symposium on Gay & Lesbian Adolescents** CME, Medical School, University of Minnesota. Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

JUNE, 1986

2-3 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building; 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

4 **Option in Cardiovascular Medicine** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-7 **15th Annual Workshops on Clinical Hypnosis-Introductory & Advanced** CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota 55455. 612/373-8012.

July 31-August 2, 1986 **Third Annual St. Paul-Ramsey Trauma Conference;** St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, WI: CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3980.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

Minnesota Physician's Directory

Richard P. Carroll, M.D.
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Space is available in MINNESOTA MEDICINE for advising MMA members of any of the above or other announcements at $27.00 per column inch per listing. The minimum order is for a 3-time consecutive listing. No changes will be made in the copy once the announcement is set in type. Advance payment must accompany the first month's insertion. All announcements will be in bold face type.

Family Practice Review: Update 1986
April 28- May 2, 1986
CME, Medical School, University of Minnesota

Place: Radisson St. Paul Hotel, 11 E. Kellogg Blvd., St. Paul, Minnesota
Contact: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast,
Minneapolis, Minnesota 55455
Telephone: (612) 373-8012

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Classified advertising rates are forty (40) cents a word; minimum monthly charge $10.00, key number, $2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400,Minneapolis 55414.

Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

Ophthalmologist, Cardiologist/Internist Specialty positions available with Mankato Clinic, Ltd. Excellent group practice opportunity in All-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R.F. Roskens, Administrator or B.C. McGregor, M.D. (507) 625-1811.

Board Certified Internal medicine practitioner seeks board eligible/ certified internist to work with him with possible acquisition of practice in the future. Edina location. Reimbursement negotiable. Contact Jane Phillip, (C1575) Minnesota Medical Services Corporation, 2221 University Avenue Southeast, Minneapolis, Minnesota 55414.

Urologist Wanted Board Certified-Board Eligible Urologist needed to join a well established downtown practice in Minneapolis. Send cirriculum vitae to: Minnesota Medicine (768) 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414.

Family practitioner for Mankato Clinic satellite office. Excellent group practice opportunity in all-American city with full hospital services. Full range of group fringe benefits, including liberal time off. Salary first year; incentive pay thereafter. For more information, call R. F. Roskens, Administrator or B. C. McGregor, M.D. (507) 625-1811.

Suburban Minneapolis Pediatric Practice desires full time pediatrician (board certified or eligible) to start April, 1986. Subspecialty interest in allergy or adolescent medicine helpful but not required. Busy diverse practice with good financial package. Contact: Gene Inett, Administrator, Metropolitan Pediatric Specialists, P.A.; 416 Southdale Medical Building; Edina, Minnesota 55435. (612) 920-9191.

Brainerd Internist seeking Board Certified/Board Eligible Internist. Beautiful resort area, only two and a half hours from Twin Cities. Community offers new 150 bed regional hospital and all specialties. Clinic offices in new professional building. First year competitive salary and benefits with early buy in. Contact: Michael O. Musty, M.D.; Brainerd Internal Medicine, Limited; 1903 South Sixth Street; Brainerd, Minnesota 56401 (218) 828-4082.

Internist/Internist-Cardiologist to join solo internist, $85,000. Box 1161, St. Cloud, Minnesota 56302.

Pediatrics and family practice positions available with our clinic. We offer OB/Gyn, surgical and family practice specialists within our group. Located at the western tip of Lake Superior in northlands of Wisconsin, Superior offers an abundance of recreational activities — skiing, sailing, hunting — excellent education system and cultural activities. Send C/V to: Chairman, Recruitment Committee, 3500 Tower Avenue, Superior, Wisconsin 54880.

Family Practice Associate desired to join established Family Practice Group in central Indiana community of 50,000. Excellent facilities, comprehensive benefits, highly competative earnings. Must be Board Certified or eligible. Send Curriculum Vitae to: D. Rogers, Business Manager, Kokomo Family Care, Inc. 806 South Berkley Road, Kokomo, Indiana 46901. 317-457-8341.

Suburban F.P. Group - SHARE affiliate - seeks associate to service rapid practice growth - competitive salary and benefits - unique opportunity to establish your practice - contact Gloria M. Vierling, Sundance Medical Clinics, LTD., 323 Naumkeag St., P.O. Box 9, Shakopee, MN 55379, (612) 445-6440.

Family Practice - Associate needed to join 4-man group, all ABFP, one member leaving soon due to health and family reasons. 65 miles North of Minneapolis, city of 2200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact Keith Clinic, P.A.; 160 SW Second Avenue; Milaca, Minnesota 56353, or call collect, (612) 983-6101.

Family Practice Practice in clinic attached to small, modern hospital, west-central Minnesota. Outstanding community for family living, excellent schools and recreational opportunities. Associate with two certified family practitioners with obstetrical, surgical and internist consultants available. For an excellent opportunity contact: Mark Rinehardt, Administrator, Johnson Memorial Hospital, Dawson, Minnesota 56232. (612) 769-4323.

Family Practice Physician Board eligible/certified physician to join supportive primary care staff to provide quality care in a successful and innovative HMO. Located in St. Cloud, Minnesota, (approximate 50,000 population, 3 colleges, full recreational activities. 70 miles from Twin Cities). New clinic facility. Full range of fringe benefits (competitive salary, liberal vacation, 2 weeks educational leave, retirement fund, etc.) Full range of FP responsibilities including OB. Must be sensitive to women's issues. Contact: Dr. Gary Strandemo, Central Minnesota Group Health Plan, 1245 15th Street North, St. Cloud, Minnesota 56301. (612) 253-5220.

BC/BE Pediatrician to join two pediatricians in an established south Minneapolis suburban pediatric practice. Part-time or full-time position is currently available. Send curriculum vitae to: Jane Phillip (C1581), Minnesota Medical Corporation, 2221 University Avenue Southeast, Minneapolis, Minnesota 55414. (612) 378-0305.

Family Practitioners Needed to associate with two-physician practice in a resort area satellite of 30 physician multi-specialty group practice. Excellent clinic and hospital facilities. Generous salary, benefits, and relocation. Call Clinic Manager collect at (701) 852-4121 or write Medical Arts Clinic, P.C., Box 1489, Minot, North Dakota 58702-1489.

Family Physician Or General Internist needed for an established primary care clinic of four Family Physicians and a General Surgeon. Guaranteed first year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth which provides excellent referral and continuing education resources. Call collect (218) 834-2171 or write Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, MN 55616.

Family Physician to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon. Liberal vacation and educational allowances. Competitive salary first year with incentive bonus, and full membership after one year. Blue Earth is a community of 4000 in Southern Minnesota with a drawing of 25,000. 43 bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D.; Blue Earth Medical Center, Ltd.; 520 South Galbraith, Blue Earth, Minnesota 56013. Phone: (507) 526-7371. Personal phone: (507) 526-3177. Marjeane Werner, Clinic Administrator Phone: (507) 526-7371. Personal phone (507) 854-3682.

Family Practice - Northridge Family Medicine Clinic, P.A. is looking for a fourth BE/BC F.P. to practice in our new clinic facilities in Mankato. Contact Tony Giefer, M.D.; 1695 LorRay Drive, North Mankato, MN 56001 or call 507-345-5293.

General Surgeon board certified or board eligible to join 16 member multispecialty group. Shares calls and works closely with two other surgeons. Competitive first year salary rapidly progressing to full shareholder. Contact: R.A. Yawn, M.D., or J.J. Sieve, Administrator, Worthington Medical Center, P.A., Worthington, Minnesota. 56187 (507) 372-2921.

Family practitioner needed to join 2 FP's at the Ellsworth, Wisconsin office of a progressive eleven physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact R. M. Hammer, M.D., River Falls, WI 54022. Phone (715) 425-6701 or (612) 436-8809.

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Gastroenterologist or Internist with subspecialty interest in gastroenterology (have all the equipment). Obstetrician/Gynecologist, General Surgeon, Internist, Family Practice in 18 physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact Richard W. Golly, Austin Medical Clinic, P.A., 101 N.W. 14th Street, Austin, MN 55912, (507) 433-7351.

Emergency Medicine - Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132 bed-hospital has an active educational program including ACLS. Contact Richard Golly, Austin Medical Clinic, 101 14th Street, N.W., Austin, Minnesota 55912. (507) 433-7351.

Family Physician - Four man Family Practice group needs to replace two leaving partners. Board eligible or certified desired. One year salary with partnership thereafter. Would also consider longterm locum tenens. Small town in Central Minnesota Lakes area. Unopposed Family Practice Clinic, 150 bed Regional Hospital at Brainerd, 100 bed Nursing Home, rotate calls. Call or write C. R. Pelzl, M.D., Pine River Medical Clinic, Pine River, MN 56474. (218) 587-4416.

Immediate Opening- Family Practitioner River Valley Medical Center is seeking two family practice Board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90 bed hospital. We are within 45 minutes to the St. Paul/Minneapolis metropolitan area. Please contact: Dr. Carl Hansen, Recruitment Chairman or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024. Phone: (715) 483-3221.

Arizona Based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years experience. Call (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 N. Country Club Rd., Suite 202, Tucson, AZ 85716.

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Bemidji Clinic, Ltd. offers excellent opportunities for well trained physicians. We are seeking Board Certified or Board Eligible physicians in Family Practice; Internal Medicine with interest in pulmonary medicine or cardiology; Ear, Nose and Throat; and Obstetrics/Gynecology. Bemidji Clinic is a 24 physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator or N.A. Skogerboe, M.D., Medical Director at (218) 751-1280.

Internist and Family Physicians needed for a growing group consisting of eight FPs, one internist, one surgeon. The clinic is attached to 50-bed hospital with brand new CCU and ER. Located along scenic chain of lakes and only 45 minu te drive from Minneapolis-St. Paul. Board eligibility required. Contact: R. Paul Post, M.D.; Chisago Lakes Medical Center; Chisago City, Minnesota 55013. (612) 257-1190.

Family Physician and Internist needed for growing southern Minnesota clinic. Associate, solo or locum tenens position available. Will adjust to accommodate. St. James Area Family Clinic, Box 471, St. James, 56081. (507) 375-3391.

Physicians: Ready for a change? Positions nationwide. BE/BC. 15 years recruiting experience. No Fee! Earl Czech, North Central Staff Services, Inc.; 4175 Lovell Road, Suite 108; Circle Pines, Minnesota 55014. (612) 786-1929.

Wanted: Family practitioner, OB/GYN. Group practice. Central Minnesota. Starting salary $45,000. Write Minnesota Medicine (755), 2221 University Ave. S.E., #400, Minneapolis, MN 55414.

Wanted: Family Physician residency trained, board certified/eligible to join one Family Practitioner age 37 in growing practice in Chanhassen, Minnesota. This community of 7000 is 20 miles from downtown Minneapolis. First year guaranteed income plus incentives and additional income opportunities available. Write or call David McCollum, M.D. at P.O. Box 423, Chanhassen, Minnesota. 55317. (612) 934-0570 or (home) (612) 448-6019.

Position Sought BE psychiatrist, also BC internal medicine, seeks psychiatry position in multispecialty medical/surgical group, preferably in Minnesota. Extensive experience in consultation, strong interests in OP psychiatry and psychotherapy. Write: Minnesota Medicine (772), 2221 University Avenue Southeast, Suite 400, Minneapolis, Minnesota 55414.

Psychiatrist Consider an employment situation that offers: a competitive salary, a 40-hour week, malpractice coverage, 30 days paid vacation and other excellent fringe benefits, in a JCAH accredited progressive medical center. The city of St. Cloud, Minnesota, and the surrounding area boasts of the high quality of family living that is afforded its residents who enjoy clean air, easy access to a wide variety of four-season outdoor recreational opportunities, excellent educational facilities which include a State University. St. John's University and the College of St. Benedict, and a full range of services available in a metropolitan setting while maintaining the quality of suburban and rural living. St. Cloud is only 75 minutes from Minneapolis/St. Paul metropolitan area. License is any state accepted. Financial assistance to defer cost of relocation. Equal Opportunity Employer. Write: Chief, Psychiatry Service, Veterans Administration Medical Center, St. Cloud, Minnesota 56301, or call (612) 252-1670, Extension 368.

OB/GYN Central Minnesota - Progressive, 9,000 member staff-model HMO seeks a second OB/GYN for its family-practice based staff. Should be Board certified or eligible and sensitive to women's issues. Excellent working environment with competitive compensation. College community located 70 miles from the Twin Cities. Contact: Deborah McCarl, M.D., 1245 15th Street North, St. Cloud, Minnesota 56301. (612) 253-5220.

Primary Care Physician - Opportunity for Internist or Family Practitioner in North Suburban area. Contact: Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, Minnesota 55429, (612) 533-8666.

Our Midsized Twin Cities hospital will have an opening on July 1, 1986 for the position of Medical Director - Emergency Room. This full time, salaried position includes both direct patient care and some administrative responsibilities, offering you a varied medical practice in an enjoyable, professional environment. We provide an excellent salary and benefit package, including educational leave, four weeks of vacation, plus all evenings, weekends, and legal holidays off. Emergency Room experience is required, Minnesota licensure with training in Internal Medicine, Surgery, Family Practice and/or Emergency Medicine preferred. Send all inquiries to Joanne Sigstad, Associate Vice President, Mount Sinai Hospital, 2215 Park Avenue South, Minneapolis, Minnesota 55404.

Internal Medicine Board certified/board eligible. Join established multispecialty group in Twin Cities metropolitan area. Excellent facilities and benefits, competitive earnings. Contact: Paul J. Brat, M.D., Medical Director; Group Health, Inc.; 2829 University Avenue Southeast, Minneapolis, Minnesota 55415.

Wanted Board Certified General Surgeon to join incorporated northern Iowa group of seven physicians to replace retiring surgeon. Target date is July 1986. Would work with present surgeon for one year and then take over the surgery practice. Experience in orthopedics and OB-GYN surgery desirable. Contact: Dr. Tom Place or Dr. Mark Steine, Osage Medical Group, Osage, Iowa 50461 or call (515) 732-3753.

Physician Wanted Five-man Family Practice Group in Anoka, Minnesota in immediate need of a Family Practice Physician. SHARE and PHP affiliation. Compensation package and salary competitive. Contact: Michael Otto, M.D., 850 E. Main Street, Anoka, Minnesota 55303. (612) 421-7070.

Busy, Established St. Paul four person Internal Medicine group needs a Board Certified Internist/Endocrinologist to fill vacancy. Call (612) 645-5711, J. Wieler.

Classified Advertisements

Physicians: Ready for a change? Positions nationwide. BE/BC. NO FEE! 15 years recruiting experience. Earl Czech, North Central Staff Services, Inc.; 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. (612) 786-1929.

Internist Excellent opportunity to join a well-established practice of two consulting internists in Mankato, Minnesota. Our office is located three blocks from a 272-bed hospital. Mankato has a population of around 40,000. We are prepared to offer a guaranteed first-year salary plus full partnership in the corporation after one year. Please send resume to: Drs. Scheidel and Winter; 304 Belle Avenue; Mankato, Minnesota 56001, or if you are going to be in the area, call (507) 388-1655.

Internist wanted to associate with five family physicians, one surgeon group, in a rural Central Wisconsin resort community. Well equipped 40-bed hospital with new ICU. Total referral source 14 physicians. Contact: J.R. Salan, M.D.; 710 Riverside Drive; Waupaca, Wisconsin 54981. Phone (715) 258-1154.

Wanted: Board certified or eligible family physician to join an established clinic of four family physicians. Contact: Gretchen D. Ehresmann, M.D.; 710 S. Division, Northfield, Minnesota 55057. Phone: (507) 645-5646 or (612) 375-0311.

Family Physician join a progressive medical community in providing medical services to the Sebeka community in Central Minnesota. Beautiful area, great community for raising family. Details - contact: Tim Schmitt, M.D.; Wadena Medical Center; Wadena Medical Center; Wadena, Minnesota 56482. (218) 631-1360.

Practice Sale Viable, well established family practice in Western Minnesota. Modern offices adjoining progressive, newly decorated 31 bed hospital. Good earnings potential in an area with exceptional recreational and hunting opportunities. Owner deceased. Negotiable financing. Contact: Pflueger, Kunz, and McLaughlin, 212 Second Street Northwest, Ortonville, Minnesota 56278.

Board Certified OB/GYN seeks group practice opportunity in Twin Cities area. Open as to type of practice. Licensed in Minnesota. Please direct inquiries to Jane Phillip (C783), Minnesota Medical Services Corporation, Suite 400, 2221 University Avenue Southeast, Minneapolis, Minnesota 55414.

Board Certified Internist, Oncologist or Gastroenterologist (willing to do General Internal Medicine) to join expanding group of Internists with offices in Downtown Minneapolis and Western Suburb. Excellent benefits and earning potential. Opportunity to work with young academically motivated group. Please contact: Dr. R.W. Kaufman or Dr. J.P. Kieley at (612) 339-7171.

Orthopedic Surgeon Wanted: Board eligible/certified Surgeon interested in tremendous career opportunity, serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics, seek an individual interested in establishing an orthopedic surgery practice in Fairmont, Minnesota. The hospital is well equipped, with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department and well-equipped surgery department. Fairmont is unique, with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator; Fairmont Community Hospital; 835 Johnson Street, Fairmont, Minnesota 56031.

Used Medical Equipment We Buy, Sell, Appraise, Liquidate, and Consign Used Equipment. From one piece to a whole hospital. Contact: Bob Godar at Scientific Locators, P.O. Box 29231, Brooklyn Center, Minnesota 55429. (612) 566-4953.

Family Practice Opportunity at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 N.E. First Street, Faribault, Minnesota 55021. Telephone (507) 334-3921.

Staff Psychiatrist, Duluth Position now available in community mental health center. Join seasoned multidiscipline staff providing variety of child and adult services. Share coverage with one other psychiatrist. Good salary and benefit package. Excellent working conditions and environment. Contact: Director, Human Development Center, 1401 East 1st Street, Duluth, Minnesota 55805. (218) 728-4491.

Classified Advertisements

Family Physician BC/BE. Multispecialty clinic of 16 board certified physicians in family practice, internal medicine, pediatrics, orthopedics, general surgery and emergency medicine. Associate physician regular visits in oncology, otolaryngology, radiology, pathology and neurology. Other specialties in town ophthalmology and urology. Historic city of 15,000 located 90 minutes from metro area, 30 minutes Mankato State University. Well balanced economy between Kraft, 3M, Pantasote, AMPI and agri business. Three excellent school systems in addition to college. Call Harold Fenske collect at 507-354-4101 or home 507-354-6059. New Ulm Medical Clinic, PO Box 667, New Ulm, Minnesota 56073.

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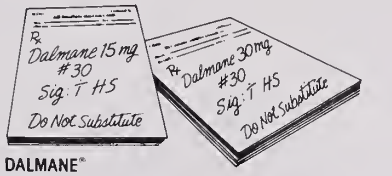

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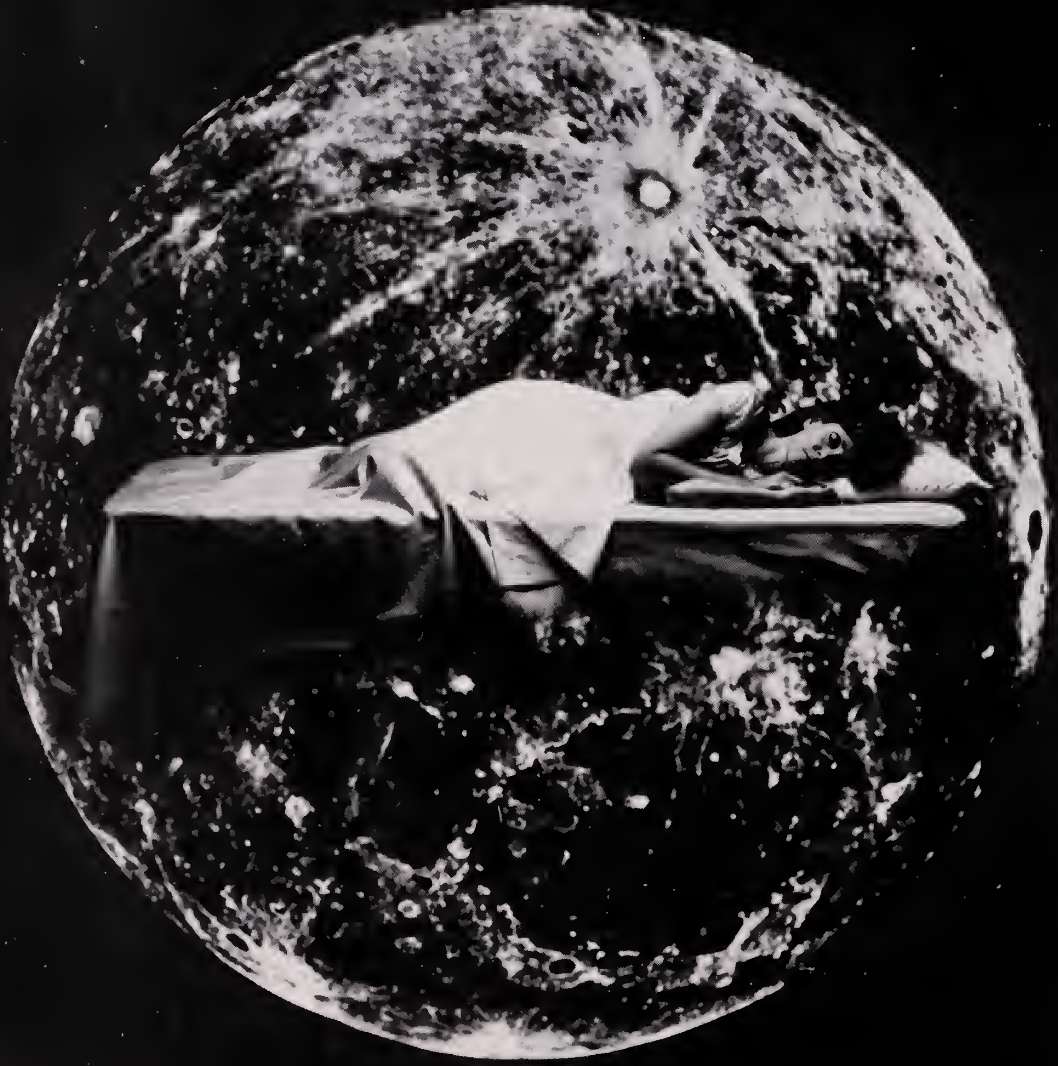

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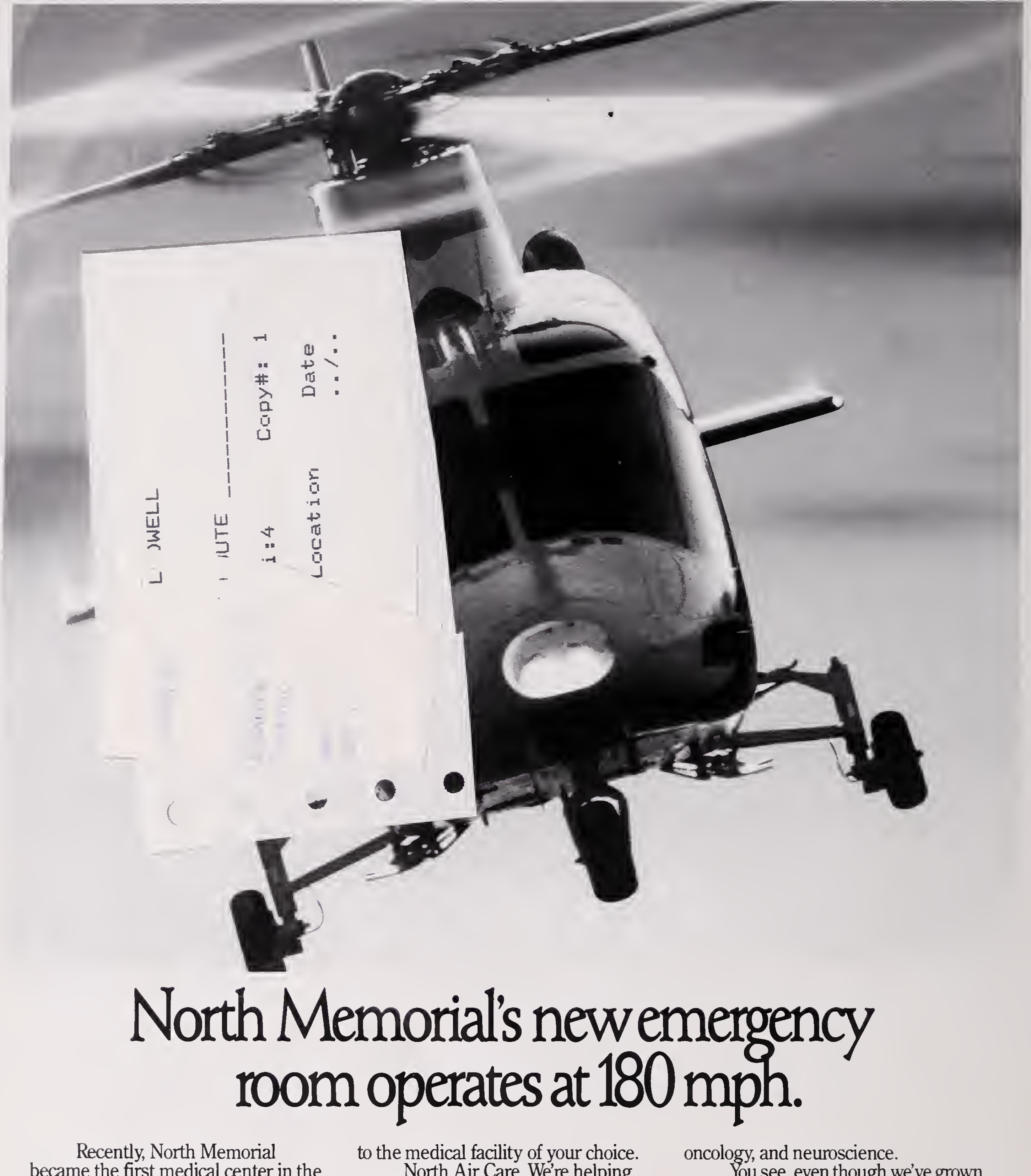

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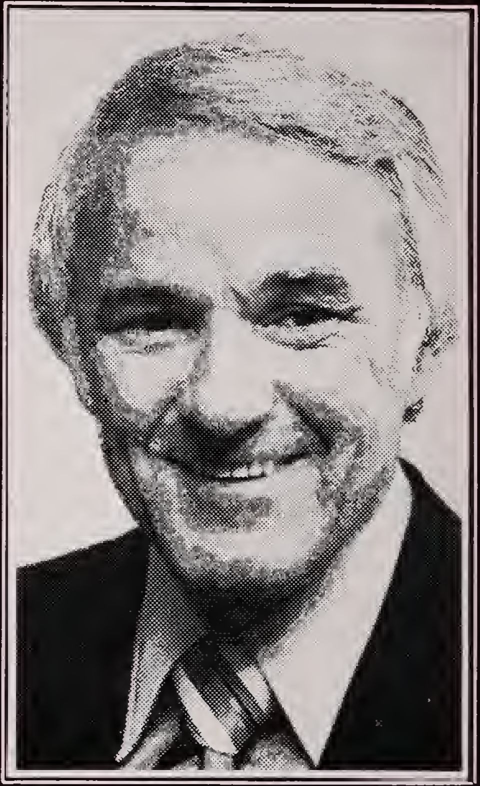

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President's Letter

The Anatomy of a Tort Reform Bill

Peggy Craig

M. Elizabeth Craig, M.D.
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As I write this, the Professional Liability Tort Reform bill has just been passed by the legislature and is on its way to the Governor for his signature.

To those physicians who question the value of membership in organized medicine and have difficulty identifying the many benefits afforded by membership, a review of the recent professional liability activities is appropriate.

The tort reform passed this session can be expected to be the beginning of controlling the spiraling cost of medical professional liability insurance in Minnesota. Just a year ago, a true malpractice crisis in Minnesota seemed immenent with no possibility of changing the climate in which physicians practice.

The bill didn't just happen. Many people and much hard work were responsible for the passage of a favorable bill and potential climate change. It was the result of foresight, planning, cooperation and a certain amount of serendipitous good fortune.

The ground work was laid in April by an action of the House of Delegates. With unusual foresight, these Delegates passed a resolution authorizing the formation of a professional liability commission, underwritten by a member assessment, to study the scope and severity of the problem.

Excellent judgment was shown in selecting Dr. John Graham to chair the Commission as well as in the choice of other members. Leaders from business, labor, medicine, law, judiciary, hospitals, insurance companies, senior citizens, and the public at large committed their time to a sometimes tedious study of liability concerns. The community feeling was that such a diverse group, each with his or her own limited perspective, could not reach any valuable or applicable agreement.

How wrong was that feeling!

The 19 Commission members met frequently throughout the summer in general sessions and later in task forces. Their report was released in October, 1985. It was widely circulated, stimulated much interest and was not—as presumed by many—a self-serving paper of the medical profession. Twenty-five recommendations were made which the physician community then used as guidelines for addressing the process of needed change in the public's expectations, court reforms and within our own profession as well.

Next, the MMA Executive Committee held a series of meetings with the leaders of the trial lawyers' organization and the Bar Association to iron out the difference in interpretation of the recommendations and to negotiate mutually acceptable provisions of a bill to bring to the 1986 Legislative Session. Few could have predicted that plaintiffs' attorneys and physicians could agree on any common ground, but a bill, for the most part acceptable to both groups, was finally produced.

About the same time, the public awareness of the general problems in obtaining liability insurance was heightened. Front page articles told of daycare closings, trucking companies going out of business, and municipalities having to curtail services and close public places because of the dramatically increased cost of liability insurance. The timing could not have been more advantageous to present a bill to the legislature.

The MMA, through its Speakers Bureau, its member key contacts with legislators, and several other aggressive public education (PEP) initiatives, carried the physicians' message of concern and its impact on the public's access to quality care to influential civic and service groups across the state. By the end of 1985, the legislator's knowledge of the necessity for tort reform was high—and so was the public's.

Writing the bill fell primarily to the highly knowledgeable staffs of MMA and MMIE. Without the efforts of these two groups, no bill would have been ready for this year's legislative session. Untold hours were spent by them in preparing and refining the bill's provisions.

In February and March, with the help of MMA staff, I traveled, in a six-day period, over 1500 miles throughout our state. Over 59 interviews were arranged with various media contacts and physician groups informing the public about our concerns and the effect of increasing malpractice insurance costs on access to quality care. The media acceptance of my message in every interview was amazing and gratifying. Each reporter, whether from newspaper, radio, or television, was knowledgeable and concerned. The resultant media coverage was much more than we could have optimistically expected. Our groundwork success was obvious, and I returned from my trip very encouraged.

We were fortunate to have highly supportive and sympathetic authors of the bill in both the House and Senate. The 1986 Legislative Session, from the physicians' perspective, was a study of emotional highs and lows. Surprisingly, our bill passed the House unanimously. But trouble in the Senate was predicted. Efforts to change the focus of the bill in the Senate almost removed it from consideration and passage this year. Thanks to the impressive efforts of our unsung-hero lobbyists, the bill was resurrected and finally passed as one of the last legislative actions.

My politicial naivete has, in the last few months, undergone an astounding educational process. My respect for all the participants involved in bringing about a tort reform bill is exceeded only by my awe at what has been accomplished in one short year. Together, the medical community, with the help of our insurance company, lobbyists, sympathetic legislators, concerned citizens, Minnesota's media, and even our formerly adversarial trial attorneys, has succeeded in passing a bill which will help to maintain access to the high quality, cost-effective medical care for which Minnesota is noted. All these groups are to be congratulated.

I have just outlined one of *hundreds* of activities undertaken to serve members by organized medicine: at the local, county, state, and national level. With the increasing complexity of medical practice, it is vitally important that each physician remain a link in organized medicine. Only through a strong membership will we have the resources and the voice needed to carry on these activities which are essential if we are to protect the integrity of our profession.

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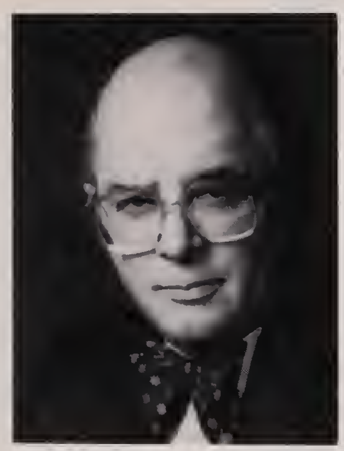

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Corporate Transformation of Medicine in Minnesota Magnum Opus: an Interview with Richard Burke, Chairman of United HealthCare Corporation, at Opus Center

Eighteenth in A Series

MINNETONKA—When you interview Richard Burke, Chairman of United HealthCare Corporation, the holding company that manages Physicians Health Plan, you get the feeling of calm. His office and his staff are quiet and unhurried. Burke himself is understated and keeps his voice low.

Thoughts While Driving

As I drove to interview Burke at Opus Center, a complex of buildings near the intersection of Highway 494 and Highway 18, at the boundary of Edina and Minnetonka, I thought how I might go about interviewing Burke. My *first thought* was to be fair and openminded, to give Burke plenty of space to present his view. My *second thought* was to have him expound on his vision—his magnum opus—of United HealthCare as a national organization. My *third thought* was to question him directly about the thinking behind PHP's Selected Hospital Plans and to ask him how he responded to his negative image among Twin Cities' physicians. My *last thought* was simply to inquire how he viewed the future.

The Setting and the Sitting

The interview took place in Burke's comfortable office. His office is tasteful and appropriate for a man of his stature and responsibilities. I found it attractive but not gaudy. Its walls contain several large oil paintings of duck scenes, reflecting his passion for duck hunting. We sat diagonally across from one another on a pair of large leather couches in the corner, with the tape recorder perched on a large glass coffee table between us. Burke greeted me graciously. We met several times before at breakfasts and share a Southern heritage. He grew up in Georgia, and I claim Tennessee as home. He attended the business school at the University of Virginia, and I graduated from Duke University Medical School. To break the ice, he said my writings reminded him of Garrison Keillor's work. I took this as a compliment, since Garrison and I are both large humorists with tall tales to tell. As far as I'm concerned, only a hairline of difference exists between us.

While exchanging these and other pleasantries, I observed Burke. He is a compact man in his early forties. He has black curly hair and radiates intense energy, tough charm, and total command. He speaks rapidly in almost hushed tones and retains a touch of southern accent. He strikes me as a man who knows exactly what he is saying.

REECE: In an article about you by Nancy Radermecher in the May, 1985 *Corporate Report*, she said United HealthCare Company was North American's largest HMO holding company and was expected to double this year. Have you doubled? What are your current revenues, and earnings, and enrollments?

BURKE: On January 1, we were, in terms of enrollment, the largest of the publicly held HMO companies. We had about 920,000 members. Among public companies, that made us the largest. In 1985, our revenues grew to about 101 million dollars. According to analysts, and to estimates floating around the street, we'll be in the 200 to 250 million dollar range for 1986. We ended 1985 with 36 HMOs in 22 states.

REECE: Could you list the states in which you had your 36 HMOs?

BURKE: We're in almost every region of the country. We're now developing a new HMO in Santa Barbara, California. We have plans in Georgia, Tampa, Florida, Greensboro, North Carolina, Columbia, South Carolina. I'm taking the warm places first. We have about five to six either operational or now under development in Texas: in Dallas, San Antonio, Austin, Corpus Cristie, and El Paso. We're also in Phoenix, Arizona, and Salt Lake City, Utah. We have plans in Minnesota, Chicago, Omaha, Des Moines, Rhode Island, and four or five in Michigan.

REECE: Why are you growing so fast? Do you attribute this to your superior marketing strategy or does the climate happen to be right? Why explosive growth at this time?

BURKE: A couple of factors are responsible. The HMOs we have developed, unlike our competitors, have been the fee-for-service variety. A fee-for-service model is a much more appealing product to sell to consumers, and you would expect enrollment results to be better.

The reason, I think, for the large growth of late is we now have 25 or 30 operational plans, and they're all contributing to enrollment; they are, with the exception of five or six capitation plans, fee-for-service plans with large panels of doctors. They're very marketable products.

We've done HMOs differently than other people have. We've done them as joint ventures or partnerships, primarily with physicians. Our timing was right last year. There's been a significant waking-up in the medical community. HMOs aren't going to go away. Physicians need to get a product out there, and we've been the primary means for the private practice doctors to compete. Up until now no other HMO company has been doing that.

REECE: How does acquisition of SHARE play into this national expansion? It's my personal theory that the reason you acquired SHARE was to give you flexibility in your national marketing strategy. You wanted complementary systems and complementary marketing plans so you could offer options in other cities. Am I correct?

BURKE: Flexibility is a major part of it. You're going to see major buyers wanting HMO options or PPO options. Having the SHARE product gives us the ability to go to the large buyers and give them all of the choices they want from one place, rather than having to get it from half a dozen.

REECE: How important are good operating systems, particularly in computers and in marketing when you go to other states? Do these homegrown and home-honed systems, developed at SHARE and PHP, work well in other states? Do they give you a leg up on your competitors?

BURKE: Yes, they do. Particularly when you're introducing a fee-for-service model HMO. Not having the computer side can be a real barrier to entry. If you look at our situation here, for example, we've got computer terminals in 700 to 800 doctors' offices, and in 400 pharmacies. We will have a claim volume here in 1986 for PHP Minnesota alone, of 3,000,000 claims. Our computer investment in that level of sophistication is enormous.

It's been a real significant help for us to go into a new marketplace, have the systems developed, tested and reliable, and be able to get them up in a matter of a month or so, and not have to do something new or start over.

Let me give you a good example. We've been asked to look at an acquisition of a little HMO that has 1,800 members. The HMO had been in business for about a year. They've spent $1,700,000 on a computer system. They were starting from scratch, and didn't know what they were doing. They've lost much of their investment trying to deal with the computer side of the business, trying to do it from scratch. They've bought the wrong hardware, and are now trying to find software to fit it. Computer systems are a major part of the operation in this business, and people who do well in it are the ones who have got the good computer systems, among other things.

REECE: Where do you see yourself 10 years from now? Where do you see the U.S. health system 10 years from now?

BURKE: Nobody can reasonably project themselves or the system five years from now, much less 10. I do subscribe to Paul Elwood's thoughts; that it's a business or industry that's rapidly consolidating; that there are going to be some very large players left when it's done. We will be one of them because we've chosen to be, and we've positioned ourselves well to be. I say this honestly. There's going to be, as we've already seen in this market, gut-wrenching changes in this business, in an industry that's not ready for it yet. People haven't been prepared for it, and there's going to be a lot of disruption.

REECE: You're speaking of the local market, so we'll now go from the global to the local. Last year, your PHP Medicare Seniors' enrollment went from 18,000 to 58,000. That's a startling escalation of your enrollment. Why did you gain so much market share so fast? How did that come about?

BURKE: Let me talk about it generally, and then specifically. At the general level, if you look at why the numbers have grown so much, I think they have because the product that we've been offering to seniors is superior compared to what else was available. The product is less expensive and better. Seniors get better coverage; they get around the administrative hassles they have if they're in the regular system; and it's much less expensive.

In our specific case, why did we do as well as we did? It was a couple of things, one was the product and the other what we're selling compared to the others. We had the services of 3,200 doctors to sell. Our product was in much more of an open access system, compared to other HMOs. It was closer to what people were used to. In the senior market, we had such a price and a product advantage that we expected dramatic results.

Another reason, again being real specific about it, we've gotten good at it. We've been at it awhile. We've learned how to sell the product. We've learned the needs of the consumer. Results in 1985 reflected that.

REECE: Let's talk money. I understand that an HMO receives 95 percent of the prevailing Medicare charges from the government if you capitate seniors in your plan. I've heard the Medicare check amounts to $185 a month.

BURKE: I don't know the precise figures. I do know from one marketplace to another in which United operates, rates vary between from the $175 level in some places to the $225 level in Chicago. The average per capita cost, Medicare's average per capita cost that they base their payment system on, varies by county and their age/sex adjustment that go with it. It's different for Hennepin County than for Ramsey County than for Dakota County, and different in outstate Minnesota.

REECE: Does the HMO receive that money when they enroll the patient at the start of the enrollment year, or do they receive it monthly?

BURKE: It's monthly. We've been at the Medicare business since 1980, we had a cost reimbursement contract with the government up until recently. This is opposed to the one that we're in now which is a risk contract under which the government just basically gives us the money they would have spent, 95% of it, and the financial risk is all ours (the HMO's). In the past, it was a cost reimbursement system.

REECE: With the acquisition of SHARE Development Corporation, the management company for Share-Minnesota, PHP-SHARE now has dominant local market share. Frankly, because of this economic power and leverage you're perceived as the Czar, some people say the Darth Vader of Minnesota health care.

Does this image disturb you? One other note, you have been quoted as saying your critics are simply ignorant of the business side of health care. In other words, if only they knew what you knew, they wouldn't be so harsh on you. Let's focus now on the latest controversy—the Selected Plan I and Plan II Hospital proposal. What is the business rationale behind that?

BURKE: Let me take the image problem first. Does criticism or adverse publicity bother me? Sure it does. I'm no different than anybody else. Anybody would rather have someone say something nice about them. Otherwise you would not be telling the truth.

Yes, we do have a significant market share here. We've been at it for 10 years, and the Twin Cities is a fish bowl where everybody can see what you're doing. We have market share because we know what we're doing.

REECE: You're well up the learning curve.

BURKE: Yes. You said I sometimes characterized critics as being people who were ignorant of the business side of this. I don't think that comment fits. Very knowledgeable people have criticized our results, and how we've gone about things. That's their prerogative. This is the kind of business, with as much change as is going on, where it's not possible to run a company successfully and not be subject to criticism. Particularly not in the business that I've been in in terms of my role at PHP.

The stockholders, if you will, or the owners of the corporation, are physicians. I report, in the sense of my PHP responsibilities, to a Board of Directors at PHP, and a majority of them are physicians. I've done that since 1977.

If you took a poll on any single decision that PHP and its Board made, you would find the normal gamut of people who thought it was a marvelous idea and some who thought it was a lousy idea. These differences tend, regrettably, to get translated into personal likes and dislikes. When people don't like a result, they tend to personalize. I'm sitting in a job where I'm frequently the person to whom the result gets personalized. There've been times I particularly didn't like the personalizing, but I've also learned there's not a whole lot I can do about it.

REECE: What was the rationale for selecting these nine Twin Cities hospitals?

BURKE: Well, let me back up one step to make sure the overview is there. There's probably a lot more made out of this than it is, but its probably understandable in light of everything else that's going on in the health care system in Minnesota.

There are a lot of people out there, because of all the change that's going on in the health care system here, who are scared; scared by what it means to them personally; scared by what it means to their job, their company and everything else. They are scared, too, because there's probably not going to be a place here for small players as survivors.

One of my responsibilities in a PHP role is to make sure that this company is here and has competitive, successful products out there for the consumer *and* physicians, that PHP is supposed to serve. People don't always understand that responsibility, or they are afraid of what it might mean. What we do and how we do it is very important to some.

We've had a select hospital plan in the market for two years. The first such product we put out there has six hospitals. We offered it to all our participating PHP hospitals and six signed up. One hospital administrator sent a letter to every other one in the Twin Cities area telling them they shouldn't participate. He subsequently didn't and his hospital didn't participate in this one either.

That particular select hospital plan now has 15 hospitals in it.

It's offered as an alternative to our more popular open-access product. Basically what we've tried to do is, in addition to offering our open access plan, is to offer a lower price product via the "select hospital concept" that will allow us to be competitive in a price sensitive market to each segment of the market.

REECE: What do you say to critics who say your move to place this low price product in the preferred hospitals stands in stark contrast to your heralded freedom of choice campaign?

BURKE: It's utter nonsense. We've had our 15 hospital select plan in the market for two years. We now have a second similar product with nine. The difference is one of them is priced at $22 a month, and the other one is at $15 a month. We are due a raise in our premiums. Instead of raising them to $22 a month across the board, we developed a new product at $15 a month. So if there were people out there who were not able to pay the extra $7 a month, they wouldn't have to leave PHP to get what they felt they needed. Each of our plans provides unlimited access to all our 3,200+ participating physicians.

Literally, what we did was to go to a group of hospitals where about 65% of our Medicare patients were already going, negotiate financial arrangements with them that essentially took the financial risk off the physicians for these members. This allowed us to offer a product at a $15 price and pass the savings on to the consumer. So now we have three PHP senior care plans instead of the two we had previously.

REECE: There is ongoing physician objection to some of the actions of the PHP Board. Is it appropriate?

BURKE: The people who sit on the Board as directors have the facts available at their hand. Regrettably every time something controversial and/or significant is done, it is going to affect some people adversely. Critics don't have the facts at hand. It's probably the big structure weakness that PHP has.

REECE: What is the structural weakness?

BURKE: It's our strength and a weakness. The strength that makes PHP work and sets it apart from others is the physician support of our products. The negative side is that when something that some people perceive as controversial is done, you have a few people who try to tear the organization apart. They don't have the perspective to realize things have to be done sometimes that adversely affect a few for the good of the majority. And I think this particular "decision" probably falls in that category.

REECE: There are critics out there who see a dark side to everything you do. For example, there's a feeling among many physicians that the acquisition of SHARE represents hybridization of the two organizations, with SHARE as the ultimate model. This is said because of certain commonalities: (1) a common management holding company; (2) the credentialing of PHP physicians at SHARE clinics and vice versa; (3) common psychological clinic testing for PHP and SHARE; and (4) a perception that the Select I contracts went to the strong SHARE hospitals. A lot of doctors think PHP is "being bled into SHARE." How do you address that criticism?

BURKE: First of all, I haven't heard it, but let me respond to the issues you raised. One, in terms of physicians in PHP joining SHARE, it was made available both ways. The SHARE physicians were offered participation in PHP and the SHARE capitation product was made available to PHP physicians. If anything, the negative to that falls on SHARE, not on PHP. We saw that yesterday when a company elected to drop the SHARE product and offer PHP. The reason they gave for it was that there was less reason to continue to offer SHARE because most SHARE doctors were in PHP. Secondly, the hospitals we selected weren't SHARE hospitals. They were selected on the basis that they represented the facilities where 65 percent of our Medicare members were already going. Period. Nothing more simple or complicated. To the best of my knowledge, SHARE doesn't even use a number of these hospitals. There wasn't any relationship between the two. It's a good example of how some people read into an issue what they may want to see. No master plot or a grand scheme exists. The fee-for-service product that we sell through PHP is not going to be turned into capitation. Capitation simply isn't the product the marketplace prefers.

There is a significant market niche for both. What we have tried to accomplish is to position ourselves to be able to offer both products to the marketplace and to have enough size and efficiency to do so successfully for the long-term.

REECE: Could you describe what "Physicians of Minnesota" is, what it does, and how it interrelates with you?

BURKE: Physicians of Minnesota is a product of the terrible, cost regulatory environment we have in Minnesota, which requires that we set up six corporations to sell two simple products. It's the holding company that "owns" PHP. It exists because, as you will recall from the adverse publicity that we received four to five years ago, we wanted to sell products as an HMO that shares with employers the results of our utilization saving. We were not able, given the Department of Health's interpretation of Minnesota law, to do that with one corporate entity. So we now have multiple entities, including a parent corporation to own them. And that entity is Physicians of Minnesota.

REECE: Select I Hospital Contracts are written under the name of PHP and the Select II contracts are written under Physicians of Minnesota. What's the significance of that?

BURKE: There isn't any significance that I know of. The contracts we have with our medical providers are with Physicians of Minnesota, or they're assigned to Physicians of Minnesota. The basic purpose is to allow us to use these agreements to market all the products we have available. Because of Minnesota regulations, some as an HMO, as a Blue Cross Service Plan product, in some cases, as an insurance product. Rather than have individual provider agreements with each of those entities for each of these products, the agreements are typically with Physicians of Minnesota. The terms and conditions are the same regardless of the product that we sell. Is that clear?

REECE: No, but your answer leads to another unclear question. In PHP's dealing with its physicians, you withhold 20 percent of the doctor's reimbursement until the end of the year. Then you either return all, part or none of that 20 percent. Or, according to a contract amendment, PHP doctors agree to pay you if they have an extravagant practice style. Is that correct?

BURKE: Generally yes, but allow me to explain so you, for certain, have it correctly. We hold back 20 percent of the amounts that would have been paid to the physician as a contingency reserve. Each specialty has an allocated portion of the PHP premium dollar. PHP is thus a "pass-through" of the premium dollar that we collect after we perform our utilization controls.

Determination of whether that money is paid back to an individual physician is based (1) on how his or her specialty did compared to budget; and (2) how the individual physician's cost-per-patient profile was compared to the other physicians in the doctor's specialty.

If there was a medical reason for a higher cost-per-patient then the adverse result is disregarded. If there is not, it's going to control whether that physician gets back any or all of that reserve money.

In addition, there is an Addendum Contract that we have some PHP physicians execute that results from their style of practice being too expensive compared to their peers. These agreements are required when it is found that the 20 percent reserve isn't adequate to cover it.

What it basically means, once a physician has signed this amendment to his standard PHP-POM participation agreement, is that the physician is committed to being paid the average cost per patient for his specialty. If the cost per patient for pediatrics next year is $80 and they come in at $100, reimbursement will be $80 per patient. In this case, the physician commits to paying back any difference between the two.

REECE: Some of these doctors that are paying back these differences are complaining that your computer system is insensitive. They say your system makes no allowances for the severity of the illness or the population mix. Is there anything to their complaints?

BURKE: No, there's not. I could provide you with the names of physicians who have been through the process and will argue just the opposite. In answering both parts of your question, (1) the physicians who were complaining four or five years ago are generally the same physicians who are complaining today. The "system" both the computer and the personal side of it, have been modified every year for the last six or seven years that it's been in effect, specifically to accommodate areas where inequity and problems have been identified.

The system and these modifications take into account the very things that you're talking about. Severity is looked at. Even, in the case of pediatrics for example, adjustments for age and sex among a physician's patients. Because of the fact that some pediatricians treat kids at a different age level than others, that difference is taken into account because the anticipated health experience is different.

Similarly, within each of the specialties, physicians who are in solo practice are compared to other physicians in solo practice, because we've found that there are acceptable differences in practice style and cost within a group versus solo practice.

In addition, there's provision in "the system" for any physician, after these reviews are finished, who still feels the data didn't provide a fair accurate result to personally present his case to the Credentials Committee.

This process occurs every year over a three to four month period, involving an enormous staff and physician time commitment. There's opportunity for each physician to bring in his charts and say "here's why my patients are sicker." In some cases, decisions are changed or reversed. In a lot of cases, they aren't. And, in the case they aren't, it is generally because the physician comes in and says: "my patients are sicker" and doesn't provide the evidence, or the data shows just exactly the opposite. The patients are just like the ones for the specialty as a whole. The system works, I think, because the people who sit on the Credentials Committee, physicians and consumers, have been there for the last five or six years. They will be the first to tell you that the system is fair and probably bends over backwards in the direction of equity.

REECE: Do you invest much money in your computer system to achieve all these refinements and enhancements? Is that a big part of your budget?

BURKE: It's an enormous budgetary item. We've had to make the investment out of necessity because of growth and complexity of the business, to rewrite the computer systems at least annually for the last 10 years. For example, we had to go to the on-line computer applications that you now see in our doctors' offices and pharmacies. Because of the volume of paper, and the speed up reimbursement to our medical providers, we designed the pharmacy system we have now a number of years ago, in part because of what we were finding in the area of abuse and other problems, to accommodate installing a drug formulary and to accommodate making such substitutions, to manufacturers, and to try to reduce the cost of the drugs in the formulary. Computers have to be made to handle this. We can't perform these functions manually at a reasonable cost.

REECE: How many computer terminals do you have in doctors' offices?

BURKE: Approximately 700 to 800.

We now receive most of our claims through terminals in doctors' offices that are directly on line with our computers. The doctors' offices are essentially filing their own claims and paying themselves. In the case of the pharmacies, terminal use is 100 percent. Every PHP pharmacy has a terminal, and every pharmacy claim is filed and paid through the terminal.

REECE: Would you say that's an essential part of any local and national marketing strategy, to have the terminal in the offices?

BURKE: No, I wouldn't. But on-line computer applications, because of the complexity of the business, is getting to be essential. But in terms of whether you absolutely have to have terminals in doctors' offices or pharmacies, at least at this point, the answer is no. We found terminals were necessary in the Twin Cities just because the volume and magnitude of what we were doing here.

REECE: You're now in a pitched battle with Blue Cross for market share, and they're about to offer a competing product. Do you have any comments on the comparative merits of the two organizations?

BURKE: No. I haven't talked to them, so I don't know whether the Blues have changed or what their strategy is. They probably do perceive it, based on the people to whom I've talked to, as a "battle." They also seem to perceive PHP as the "enemy." I don't perceive it that way.

This is a competitive business with opportunities for more than one organization to thrive and do well. If both organizations do well, the physicians and consumers will do well. I made the comment a few years ago that the best thing that could happen to the medical community here would be for Blue Cross to change and prosper. I hope they do.

The big difficulty confronting physicians a few years ago was that fee-for-service medicine was dying. It wasn't dying because of PHP, but was dying because Blue Cross didn't have a competitive product in the marketplace. For everybody, I think, whether it's the buyer or the physician, it's frankly advantageous that Blue Cross and other competitors exist and that they're doing well.

REECE: Let me get this straight. You're saying you welcome competitive fee-for-service products, and you believe properly priced fee-for-service products can "win" in this market against other HMO models?

BURKE: Oh, I absolutely believe that. I've been in this business since 1971. I've developed and managed group models—staff models, network IPAs, capitation and fee-for-service plans. The fee-for-service model has a definite market niche and advantage. The capitated model likewise has its advantages and disadvantages, but clearly isn't as marketable. Just look at PHP's enrollment results over the last years compared to our competitors. Similarly, look at the "new" products that our HMO and other competition is trying to offer. Basically they are geared toward greater "freedom of choice" for the consumer and fee-for-service payment.

The fee-for-service product, though, is going to be appealing to a larger number of people in the marketplace. It's a more flexible product in terms of what you're able to do for the consumer, whether it's the buyer, the consumer or whatever. We've shown with our hospital bed utilization rates that we can get our fee-for-service product priced at or near the capitation model plans. That's literally all we have to do to compete and dominate.

REECE: So, you can seize the window of opportunity quicker with a fee-for-service model, if you're expanding either locally or nationally. Isn't it true you can capture more market share quicker with the fee-for-service HMO model?

BURKE: The fee-for-service model is easier to develop, quicker, cheaper, at least initially. It's a product that is more appealing to specialists. The capitated product, by contrast, is more appealing to the primary care physicians, but far less so to the consumer. The economics, I think, get to be very appealing to primary care physicians as they begin to better understand it.

REECE: About six weeks ago, the Wall Street Journal ran a front page article saying HMO growth would be sluggish because of increasing competition, because of increasing skepticism by business, and because of the Blues getting more street smart about how to compete. As things stand now, Twin Cities HMOs have about 40 percent market share. Nationally, HMO penetration is eight percent. How do you see the next five years going? Will marketing battles intensify? Will HMOs gain more market share? Will the rest of the country simulate what we've done here?

BURKE: I've changed my mind a half a dozen times on these issues over the past few years. I would now predict that 50 to 60 percent of the population nationally will be enrolled in what are generically called HMOs by 1990. Ultimately, it's going to be 80 to 90 percent. You'll see the Blues convert and become this type of product, which will balloon the statistics. I don't see the growth rate being sluggish. I see the growth as increasingly explosive. Exactly as you've seen here. Among both physicians and "HMO companies," there will be groups that do well and some that don't, depending on how creative and responsive they are to the changes in the marketplace.

You will see a tremendous amount of turmoil. But if you look around you, for every physician who's not doing well with these changes, you'll see two that are doing as well or better than before. The difference is that those who are doing well have adapted to change. And those that adapt and respond will continue to do well.

Richard L Reece MD

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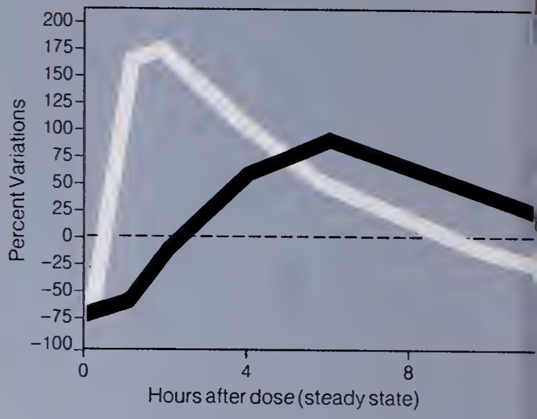

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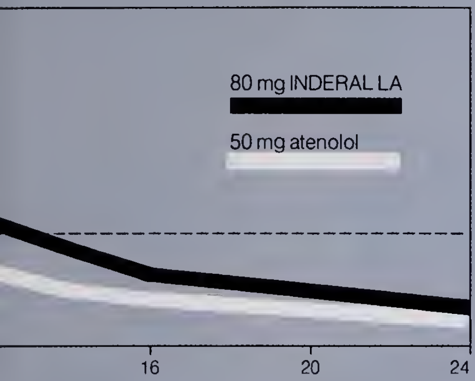

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WARNINGS

Propranolol hydrochloride (INDERAL® LA): CARDIAC FAILURE: Sympathetic stimulation may be a vital component supporting circulatory function in patients with congestive heart failure, and its inhibition by beta blockade may precipitate more severe failure. Although beta blockers should be avoided in overt congestive heart failure, if necessary, they can be used with close follow-up in patients with a history of failure who are well compensated, and are receiving digitalis and diuretics Beta-adrenergic blocking agents do not abolish the inotropic action of digitalis on heart muscle.

IN PATIENTS WITHOUT A HISTORY OF HEART FAILURE, continued use of beta blockers can, in some cases, lead to cardiac failure Therefore, at the first sign or symptom of heart failure, the patient should be digitalized and/or treated with diuretics, and the response observed closely, or propranolol should be discontinued (gradually, if possible).

> IN PATIENTS WITH ANGINA PECTORIS, there have been reports of exacerbation of angina and, in some cases, myocardial infarction following *abrupt* discontinuance of propranolol therapy Therefore, when discontinuance of propranolol is planned the dosage should be gradually reduced and the patient carefully monitored In addition, when propranolol is prescribed for angina pectoris, the patient should be cautioned against interruption or cessation of therapy without the physician's advice. If propranolol therapy is interrupted and exacerbation of angina occurs, it usually is advisable to reinstitute propranolol therapy and take other measures appropriate for the management of unstable angina pectoris Since coronary artery disease may be unrecognized, it may be prudent to follow the above advice in patients considered at risk of having occult atherosclerotic heart disease who are given propranolol for other indications.

THYROTOXICOSIS: Beta blockade may mask certain clinical signs of hyperthyroidism. Therefore, abrupt withdrawal of propranolol may be followed by an exacerbation of symptoms of hyperthyroidism, including thyroid storm Propranolol does not distort thyroid function tests.

IN PATIENTS WITH WOLFF-PARKINSON-WHITE SYNDROME, several cases have been reported in which, after propranolol, the tachycardia was replaced by a severe bradycardia requiring a demand pacemaker In one case this resulted after an initial dose of 5 mg propranolol.

MAJOR SURGERY The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial It should be noted, however, that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)—PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS. INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes In these patients, it may be more difficult to adjust the dosage of insulin. Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease In patients with renal disease, thiazides may precipitate azotemia In patients with impaired renal function, cumulative effects of the drug may develop.

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs. Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs.

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL. Propranolol should be used with caution in patients with impaired hepatic or renal function Propranolol is not indicated for the treatment of hypertensive emergencies.

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure. Patients should be told that propranolol may interfere with the glaucoma screening test Withdrawal may lead to a return of increased intraocular pressure.

CLINICAL LABORATORY TESTS: Elevated blood urea levels in patients with severe heart disease, elevated serum transaminase, alkaline phosphatase, lactate dehydrogenase.

DRUG INTERACTIONS: Patients receiving catecholamine-depleting drugs, such as reserpine should be closely observed if propranolol is administered. The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity, which may result in hypotension, marked bradycardia, vertigo, syncopal attacks, or orthostatic hypotension

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential. In 18-month studies, in both rats and mice, employing doses up to 150 mg/kg/day, there was no evidence of significant drug-induced toxicity There were no drug-related tumorigenic effects at any of the dosage levels Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY Pregnancy Category C. Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose. There are no adequate and well-controlled studies in pregnant women Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus

NURSING MOTHERS Propranolol is excreted in human milk Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE Safety and effectiveness in children have not been established

Hydrochlorothiazide: GENERAL Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely Hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids. Medication such as digitalis may also influence serum electrolytes. Warning signs irrespective of cause are: Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg, increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content.

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt, except in rare instances when the hyponatremia is life-threatening In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy.

Insulin requirements in diabetic patients may be increased, decreased, or unchanged Diabetes mellitus which has been latent may become manifest during thiazide administration.

If progressive renal impairment becomes evident, consider withholding or discontinuing diuretic therapy.

Thiazides may decrease serum PBI levels without signs of thyroid disturbance.

Calcium excretion is decreased by thiazides Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration, have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function.

DRUG INTERACTIONS. Thiazide drugs may increase the responsiveness to tubocurarine.

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient. Thiazides may decrease arterial responsiveness to norepinephrine This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use

PREGNANCY. Pregnancy Category C. Thiazides cross the placental barrier and appear in cord blood The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus. These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

NURSING MOTHERS: Thiazides appear in human milk. If use of the drug is deemed essential, the patient should stop nursing

PEDIATRIC USE. Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy

Cardiovascular Bradycardia; congestive heart failure; intensification of AV block, hypotension, paresthesia of hands; thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type.

Central Nervous System Lightheadedness; mental depression manifested by insomnia, lassitude, weakness, fatigue, reversible mental depression progressing to catatonia, visual disturbances; hallucinations; an acute reversible syndrome characterized by disorientation for time and place; short-term memory loss; emotional lability; slightly clouded sensorium; and decreased performance on neuropsychometrics.

Gastrointestinal Nausea, vomiting, epigastric distress, abdominal cramping, diarrhea, constipation; mesenteric arterial thrombosis, ischemic colitis

Allergic. Pharyngitis and agranulocytosis, erythematous rash; fever combined with aching and sore throat; laryngospasm and respiratory distress.

Respiratory Bronchospasm.

Hematologic Agranulocytosis; nonthrombocytopenic purpura, thrombocytopenic purpura

Auto-Immune In extremely rare instances, systemic lupus erythematosus has been reported

Miscellaneous Alopecia, LE-like reactions; psoriasiform rashes; dry eyes; male impotence; and Peyronie's disease have been reported rarely Oculomucocutaneous reactions involving the skin, serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol.

Hydrochlorothiazide:

Gastrointestinal. Anorexia; gastric irritation, nausea, vomiting, cramping, diarrhea, constipation; jaundice (intrahepatic cholestatic jaundice), pancreatitis, sialadenitis.

Central Nervous System: Dizziness, vertigo; paresthesias; headache; xanthopsia

Hematologic Leukopenia, agranulocytosis; thrombocytopenia, aplastic anemia

Cardiovascular: Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).

Hypersensitivity Purpura, photosensitivity, rash, urticaria, necrotizing angiitis (vasculitis, cutaneous vasculitis); fever, respiratory distress, including pneumonitis, anaphylactic reactions.

Other. Hyperglycemia, glycosuria, hyperuricemia, muscle spasm; weakness, restlessness, transient blurred vision.

Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

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Fine-Needle Aspiration Biopsy of Solitary Thyroid Nodules

Effect on Cost of Management, Frequency of Thyroid Surgery, and Operative Yield of Thyroid Malignancy

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We examined the influence of fine-needle aspiration biopsy on the management and cost of care of patients with thyroid nodules. Eighty-four patients were studied before and 115 patients after the introduction of this diagnostic procedure. Ninety-seven of the latter were studied with one or more biopsies. The percentage of patients operated upon decreased from 61 to 39% while the frequency of carcinoma in surgical specimens (excluding "occult" cancers) increased from 16 to 27% after the introduction of fine-needle aspiration biopsy. The mean cost of care was reduced by almost $600.

We conclude that fine-needle aspiration biopsy of thyroid nodules is a safe and cost-effective technique that reliably helps to select patients who require surgical management.

Solitary thyroid nodules affect approximately 3% of the U.S. population, while malignant tumors are rare[1]. The primary aim of thyroid nodule management, therefore, is to identify those patients harboring malignant tumors but to avoid operations in patients with benign lesions. In addition to clinical assessment and response to thyroid hormone administration, traditional diagnostic approaches use thyroid scintigraphy and ultrasonography. Unfortunately, these methods lack specificity[2]. Fine-needle aspiration biopsy of thyroid nodules is now widely utilized to distinguish benign from malignant lesions[3-14]. Physicians can safely perform this procedure in the office with an accuracy of more than 90%[3]. Recently, Hamberger and coworkers established the cost-effectiveness of fine-needle aspiration biopsy[15]. These and other investigators also determined that the number of patients referred for surgery was reduced, while the percentage of thyroid cancer in surgically treated patients was increased.[7,10,15,16] In this study, we assessed the effect of fine-needle aspiration biopsy on the cost of management, the frequency of surgery, and the yield of malignancy in patients with solitary thyroid nodules evaluated at the Gundersen Clinic.

Materials and Methods

Patients

Fine-needle aspiration biopsy of thyroid nodules was introduced at the Gundersen Clinic in April, 1982. We reviewed the medical records of all patients evaluated for thyroid nodules from March, 1980 to December, 1983. We tabulated for each patient the results of pertinent history, physical examination, laboratory tests, thyroid surgery, and pathologic findings. Eighty-four (65 women and 19 men) were evaluated before (Group A) and 115 (105 women and 10 men) after (Group B) the introduction of fine-needle aspiration biopsy.

Fine-Needle Aspiration Biopsy

Fine-needle aspiration biopsies were obtained with a 25-gauge needle attached to a disposable 10 ml. plastic syringe and Cameco® syringe pistol. The aspiration biopsy, performed as an outpatient procedure without anesthesia, was safe and did not produce complications. Multiple aspirations were taken from each nodule. The material obtained was injected into approximately 40 ml. of a 50:50 mixture of ethyl alcohol and normal saline. This was subsequently filtered through an 8 micron Nuclepore® filter and stained by the Papanicolaou method. One of us (SW) classified the cytologic findings as benign, possibly malignant, malignant or unsatisfactory.

Results

Clinical Characteristics

Historical data and findings on physical examination are summarized in Table 1. One patient in Group B had two nodules; the remaining patients in both groups had solitary lesions. There were more women ($p < 0.001$) and goiter was more frequent ($p < 0.05$) in Group B patients. Other characteristics, however, such as age distribution, the frequency of previous thyroid surgery or neck irradiation, and the mean free thyroxine index were the same in both groups. The mean duration of the thyroid nodule prior to evaluation, size and consistency of the nodules also did not differ significantly (Table 1).

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Management of Patients without Fine-Needle Aspiration Biopsy

Of the 84 patients studied before the introduction of fine-needle aspiration biopsy, 75 (90%) were evaluated with thyroid scintigraphy. The following results were recorded: hypofunctional ("cold or cool") nodules, 30; indeterminate ("warm") nodules, 19; normal, 13; hyperfunctional ("hot") nodules, 11; other findings, 2. Thyroid echography was performed in 25 (30%) of Group A patients. The results were as follows: solid nodule, 9; cystic lesion, 4; mixed lesion, 9; other findings, 3.

Of the 84 patients in Group A, 51 (61%) underwent thyroid surgery. Nine (18%) of the surgical patients had cancer. Two papillary carcinomas, including one "occult" cancer (less than 1 cm. in diameter), were found in the walls of cysts. The other malignancies included four follicular carcinomas, 2 papillary carcinomas, and one lymphoma.

Management After the Introduction of Fine-Needle Aspiration Biopsy

After the introduction of fine-needle aspiration biopsy, 115 patients were evaluated for thyroid nodules. Of these, 62 (54%) were evaluated with thyroid scintigraphy. The scan results were as follows: hypofunctional, 28; indeterminate, 6; hyperfunctional, 6; normal, 15; other findings, 7. Other than a higher frequency of hyperfunctional nodules in Group A patients ($p < 0.05$), the thyroid scintigraphy results were similar in Group A and Group B patients. Results of thyroid echography, performed in 12 (10%) Group B patients, were as follows: solid, 5; cystic, 3; mixed, 3; other findings, 1. These results were similar to those found in Group A.

Of the 115 patients evaluated after the introduction of fine-needle aspiration biopsy, 97 had one or more biopsies performed. The aspirates were classified as benign in 53 (55%) patients in whom satisfactory preparations were obtained. For most of these 53 patients, thyroid hormone treatment, follow-up examination, and repeat biopsy at one year were recommended. Surgery was performed in 11 patients. Benign adenomas were found in 10; an incidental 2.5 mm. papillary carcinoma within an adenoma was found in another patient. Three (3%) of the patients had malignant cells detected on fine-needle aspiration biopsy. Of these, two had papillary carcinoma; the other patient had a benign adenoma with radiation-induced nuclear atypia. In 31 (32%) patients, the aspirate was classified as possibly malignant. Thyroidectomy in these patients revealed the following: benign adenoma, 9; non-toxic goiter, 5; atypical adenoma, 1; chronic thyroiditis, 3. Ten patients had the following malignant lesions: papillary carcinoma, 5; follicular carcinoma, 2; metastatic anaplastic breast carcinoma, 1. A 1.2 cm. papillary carcinoma was found in a benign cyst wall and a 2.5 mm. papillary carcinoma was deteced adjacent to the capsule of a benign adenoma. With regard to the remaining three patients with suspicious cytology, surgery was refused or not yet performed. Fine-needle aspiration biopsy was unsatisfactory in 10 (10%) patients. A colloid nodule was removed from one of these patients. Fluid was aspirated from the thyroid lesion in 4 patients during the biopsy procedure. In two, the lesion disappeared and has not recurred. In the other two, the lesions temporarily decreased in size.

TABLE 1

Characteristics of Patients with Thyroid Nodules
Evaluated before (Group A) and after (Group B) the Introduction
of Fine-Needle Aspiration Biopsy

	Group A	*Group B*
Number of patients	84	115
Sex Radio (M/F)*	19/65	10/105
Mean age (year)	48	50
Previous thyroid surgery (%)	8	7
Previous thyroid irradiation (5)	4	2
Goiter (%)†	7	16
Mean free thyroxine index	3.2	3.2
Duration of nodule (year)	1.1	1.7
Mean size (cm.)	2.7	2.6
Consistency of nodules (%): hard	11	9
firm	75	68
soft	14	23

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* $p < 0.001$ (chi-square test)
† $p < 0.05$ (chi-square test)

Surgery has not been performed in 9 patients.

After the institution of fine-needle aspiration biopsy, 18 patients with thyroid nodules were evaluated without biopsy. Two of these were operated upon. One patient had a third recurrence of papillary thyroid cancer. The other displayed a 3 mm. occult papillary carcinoma in addition to an atypical follicular adenoma.

In summary, surgery was performed on 45 of 115 (39%) Group B patients and thyroid malignancies were found in 15 (33%) of patients undergoing surgery. Therefore, despite a reduction of thyroid surgery from 61% ($p < 0.001$) since the introduction of fine-needle aspiration biopsy, the frequency of thyroid cancer found at operation has increased from 18 to 33%. If "occult" carcinomas are excluded the yields of malignancy are 16 and 27% in Groups A and B, respectively.

Cost of Care

After the introduction of fine-needle aspiration biopsy, the frequency of thyroid scanning was reduced from 90 to 54% ($p < 0.001$) and the frequency of thyroid echography was diminished from 30 to 10% ($p < 0.001$). Thus, the costs (charges for patients) for these procedures (Table 2) were reduced. The expense of miscellaneous thyroid tests, (serum thyroxine, free thyroxine index determinations, triiodothyronine, thyrotrophin, and thyroid antibody determinations) were comparable in both groups of patients. Thus, despite the added expense of the fine-needle aspiration biopsy, the reduced costs for thyroid scintigraphy and echography resulted in comparable diagnostic expenses. The cost of thyroid surgery and 3 days of hospitalization at LaCrosse Lutheran Hospital is $3,391. Thus, the reduction in surgery after the institution of fine-needle aspiration has significantly ($p < 0.005$) reduced the average cost of managing a patient with a thyroid nodule by almost $600 (Table 2).

Thyroid Scintigraphy and Ultrasonography in Patients with Thyroid Cancer

Thirteen patients with surgically-proven carcinoma including two patients with occult papillary cancer, had thyroid scintigraphy performed. Eight of the scans revealed hypofunctional nodules, and five were functional ("warm"). Thyroid echography in seven patients with thyroid cancer revealed solid lesions in five, mixed solid and cystic lesion in one, and a normal study in another.

Discussion

This study indicated that fine-needle aspiration biopsy of the thyroid gland reduced the cost of managing patients with thyroid nodules, reduced the frequency of thyroid surgery and increased the yield of carcinoma in operatively removed thyroid lesions. Patients evaluated before and after the introduction of fine-needle aspiration biopsy did not display important clinical differences, and other than a higher frequency of hyperfunctional nodules in patients evaluated without biopsy, the results of thyroid scintigraphy and echography were also similar. Thyroid scintigraphy and echography results were not specific in our thyroid cancer patients, findings in agreement with the extensive studies of Van Herle and coworkers[2,3].

Fine-needle aspiration biopsy demonstrated benign-appearing cytology in 55% of patients. Of the 11 patients with benign cytology operated upon, only an occult papillary carcinoma was found. The average frequency of false negative results is 2.6% in studies cited in a recent review[3]. Therefore, clinical factors suggesting an increased risk of cancer (i.e., youth, male sex, suspicious cervical lymph node enlargement, rapid growth of the nodule, radiation exposure, or other factors) should also be taken into consideration in determining management when the cytologic findings are benign[10]. In addition, we currently recommend thyroid hormone

TABLE 2

Costs for the Management of Thyroid Nodules before (Group A) and after (Group B) the Introduction of Fine-Needle Aspiration Biopsy

Procedure	*Cost per Procedure*	*Group A*	*Group B*
Thyroid scintigraphy	$ 83.85	$ 7,156	$ 6,155
Thyroid echography	$ 92.45	$ 2,311	$ 1,109
Miscellaneous laboratory	—	$ 3,439	$ 5,710
Fine-needle aspiration biopsy		—	$ 8,977
Number of operations*		51 (61%)	45 (39%)
Cost of surgery and hospitalization	$ 3,391	$172,941	$152,595
Mean cost per patient†	$ 2,112	$ 1,518	

* $p < 0.001$ (chi-square test)
† $p < 0.005$ (student's T-test)

suppressive therapy and follow-up physical examinations for patients with negative cytologic findings who are not otherwise surgical candidates and also suggest repeat biopsy in one year, or sooner if the thyroid nodule increases in size.

Thirty-two percent of fine-needle aspirates were judged to be possibly malignant. Twenty-eight patients with this cytologic finding were operated upon. Ten (38%) of these proved to have cancer whereas 18 had benign lesions. One false-positive diagnosis was made among the three specimens classified as malignant. The pathologist was unaware of the history of neck irradiation in the patient displaying the false-positive result. The severe nuclear atypia seen in the aspirate and surgical specimen was undoubtedly due to the previous irradiation. Thus, of the 31 surgically treated patients who were classified as malignant or possibly malignant by cytology, 12 (39%) had malignant lesions.

After we introduced fine-needle aspiration biopsy to our clinic, the frequency of thyroid cancer in patients undergoing surgery for thyroid nodules increased from 18 to 33% even though the percentage of patients undergoing surgery decreased from 61 to 39%. As in other thyroid biopsy studies, we encountered the problem of the "occult" thyroid carcinoma (cancers less than 1 cm. in diameter)[7,9]. These lesions, occurring in up to 13% of routine autopsies, may be viewed as incidental findings and disregarded for the purpose of evaluating the efficacy of fine-needle aspiration biopsy[17]. Excluding "occult" carcinomas from our analysis reduced the yield of malignancy in surgically treated patients to 16 and 27% in Groups A and B, respectively. Our results are similar to the findings of Hamberger and coworkers[15]. After introducing fine-needle aspiration biopsy at the Mayo Clinic, these investigators noted that the frequency of carcinoma in surgically treated patients doubled to 29% while the frequency of surgery decreased from 67 to 43%. In an extensive review of literature covering 38 years, Werk and coworkers determined the frequency of thyroid cancer in patients undergoing surgery for thyroid nodules[16]. They grouped the investigations according to the following criteria: Group 1, "all" patients with nodules went to surgery; Group 2, some patients went to surgery after screening with clinical evaluation, thyroid scintigraphy, thyroid echography and thyroid suppression; Group 3, patients went to surgery after screening methods of Group 2 and the results of fine-needle aspiration biopsy. The mean frequency of carcinoma for the groups were 13.8, 21.8, 27.9% respectively. The percentage of carcinoma found in Group 2 and 3 were significantly higher than detected in Group 1 and were similar to the frequency of carcinoma detected in our comparable patients.

Our findings agreed with the observations of Hamberger and coworkers and indicated that fine-needle aspiration biopsy substantially reduces the cost of management of patients with thyroid nodules[15]. Savings from reduced testing with thyroid scintigraphy and echography and more importantly, reduced frequency of surgery, lowered the mean expense of managing patients with thyroid nodules by almost $600.

Solomon and Keeler recently suggested that fine-needle aspiration biopsy might be the best *initial* test for the diagnosis of thyroid nodules[2]. Hyperfunctioning nodules are almost always benign, and as some other follicular adenomas, frequently produce a highly cellular cytologic appearance difficult to distinguish from follicular carcinoma. These investigators, therefore, recommended that thyroid scintigraphy be performed before surgery in patients with suspicious cytology to avoid operating on patients with benign "hot" nodules. Since our study was retrospective, we believe that further cost savings and a higher yield of malignancy in surgically treated patients may be achieved by closer adherence to the diagnostic approach suggested above[2].

Acknowledgments

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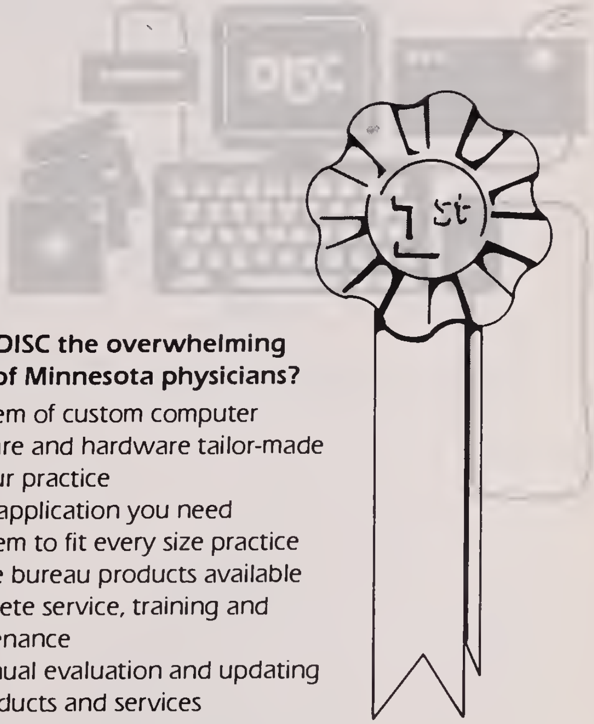

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Short History of Plaster-of-Paris Cast Immobilization

DENNIS J. CALLAHAN, M.D.* and
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Rigid immobilization of broken bones and injured joints dates back to antiquity. Monro states that the Egyptians were making splints from linen, stiffened with gum and plaster, one thousand years before Joseph became Governor under Pharaoh.[10]

Hippocrates, writing around 350 B.C., described the use of bandages impregnated with gum, resins and waxes for fracture immobilization.[10]

An Arabian physician, Rhazes, used lime and egg whites as stiffening agents. The Europeans continued using egg whites, gum and resin for stiffening agents into the 1800s, even though the existence of plaster-of-Paris had been known.[2] British surgeons serving in Turkey and India encountered the use of plaster-of-Paris for immobilization in those countries.[10]

Hubenthal, in the early 1800s, reportedly constructed anterior and posterior molds to an injured limb by applying plaster-of-Paris with a spatula.[10] Koyl, Kluge, and later Dieffenbach, developed a true "casting" technique, in which the injured limb was placed in a wooden box into which plaster was then poured.

The modern era of casting is traced to a pamphlet on the use of plaster-of-Paris in the treatment of fractures, published in 1852 by a Dutch Army surgeon, Anthonius Mathysen.[2,7,9] Plaster-of-Paris was hand rubbed into open mesh cotton cloth, later crinoline, which was then rolled into bandages. These plaster-impregnated bandages could then be carried onto the battlefield for immediate availability. However, each bandage had to be prepared individually; the plaster would adhere to the bandage only for a short time; and exposure to moisture would ruin the bandage. In spite of these disadvantages, the advantages of convenience, ease of application, and excellent molding characteristics soon made the use of these plaster bandages widespread. Devices were constructed to speed the process of hand rubbing the plaster into the bandages. Sifters were used to insure that the plaster was finely powdered in order to improve its adherence to the bandages. Cameron said that the plaster rooms of the day could be mistaken for bakeries, where a "white gowned physician," covered with white powder, could be seen dipping a flour sifter into a barrel of white powder, sifting and rubbing it into the meshes and folds of gauze, subsequently plunging it into a pail of water and vigorously rubbing it onto a flat surface."[2]

This method of hand rubbing the plaster into bandages continued in Britain until the 1930s. Binders such as starches, gums, resin, dextrins and polymers were developed which could be added to the plaster, causing it to adhere to the bandages. The addition of these binders allowed commercial preparation of the cast bandages, which could then be transported and stored without loss of the plaster from the bandages.[2] The use of these commercial cast bandages slowly spread to this country, although in the mid-1940s hand-prepared bandages were still in widespread usage.[5,9] In fact, this method was known to have been used in one major trauma center into the mid-1960s.

The substance plaster-of-Paris itself, is derived from gypsum $(CaSO_4)_2(2H_2O)$. The color is usually white, but may be red, green, blue, gray, brown or black, and varies from transparent to opaque. Gypsum is found in various natural states: selenite, the clear colorless crystals; alabaster, as large fine grain; satin spar, the fibrous form; and gypsite, an impure form. Plaster-of-Paris is formed through a process called calcination, in which the natural form is heated to about 350°F., driving off about three-fourths of the water of crystallization and leaving a fine white anhydrous powder, plaster-of-Paris. The addition of water to this substance produces an exothermic reaction, theoretically producing the same amount of heat as required in the original calcination reaction. The powder swells, rapidly sets and then cures over several days, forming a stone-like material, as the excess water evaporates. Keene's plaster or cement is formed by heating the calcinated powder to drive off 100% of the water of crystallization. This powder can also be set and cured with the addition of water. Although the process is slower, the final product is somewhat stronger and more resistant to moisture than that of plaster-of-Paris.

The setting time of the plaster-of-Paris can be hastened by adding accelerators, like alum, borax,

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caustic barite, salicylic acid, zinc, magnesium, copper, iron, or aluminum, or slowed by adding retarders like glue, gum arabic, dextrin, and powdered marshmallow root, to either the dry powder or the water.

As can be seen, the modern use of plaster cast immobilization of fractures has been developed slowly over centuries. Many of the topics thought of as modern concepts, such as: "fracture disease," functional casting and early immobilization, in fact date back centuries.[2,10] Yet the technique of cast immobilization remains an art, or a craft if you will, passed on from master to apprentice. Varied opinions have been advanced regarding padding, molding, splint reinforcement, water temperature, etc.[1,3-6,8,9,11,12,14]

There have been a few experimental studies to analyze these variables. Luck performed a number of early experiments on hand-prepared crinoline bandages, looking at the splint reinforcement, soaking time, water temperature, and movement.[9] On the basis of these experiments, he presented guidelines for cast application. However, he did not make any effort to analyze the data in detail. Many of his guidelines were, in fact, not supported with any data. Yet, he did point out the very important concept that any movement while the cast was setting-up, "the critical period," would significantly weaken the cast. He used both data from the microscopic crystalline structure and data from biochemical testing to document this concept. Others had reiterated this point.[5,6] Luck also illustrated that the optimum arrangement for reinforcement splints was in the plane of movement of the joint.[9] No other experimental studies on casting technique are found in the literature until the excellent work by Schenck, Somerset, and Porter.[13] They established a uniform standard for future measurements. They tested the strength of standard cast samples in compression, as well as testing wear and fatigue of actual casts applied to the extremities of subjects.

These two studies provide the basis for some of the casting principles.[1,3,5,6,11,14] Orthopaedic casting techniques remain learned skill, for the most part, passed on from one generation to the next. Considering the tremendous changes in medicine, it is interesting to observe plaster casts being applied in a manner little different than that described by Mathysen one hundred thirty years ago.

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Cover Photograph

"Indian Pipes"

Charles E. Mehlberg, RPH, Director of Pharmacy Services at Miller-Dwan Medical Center in Duluth, took the cover photograph by the Black River north of Bessemer, Michigan, in 1982.

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Pharmacist Mehlberg was born in the Upper Peninsula, Michigan, and schooled at Serris State College in Big Rapids, Michigan. He likes sailing and photography.

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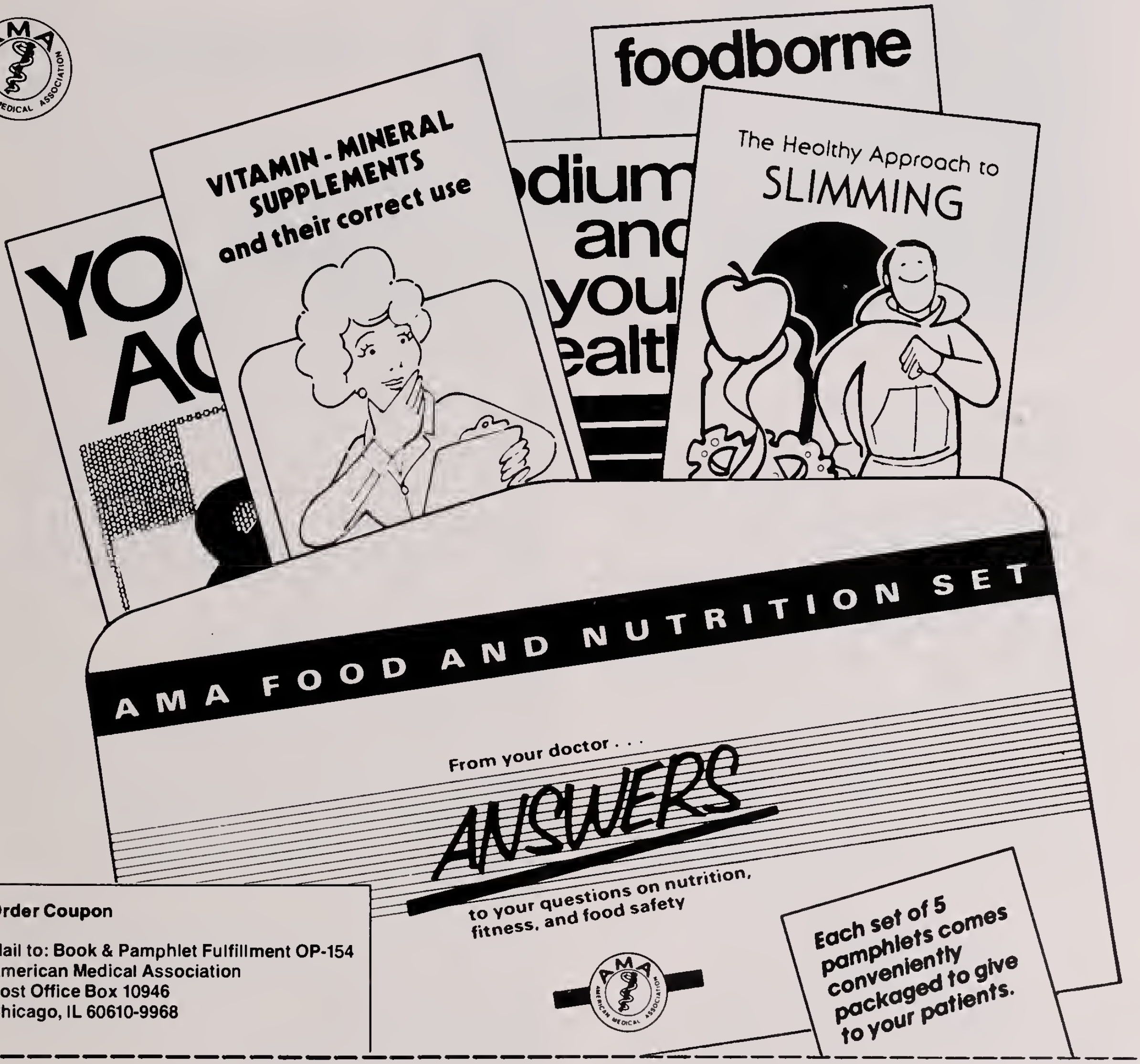

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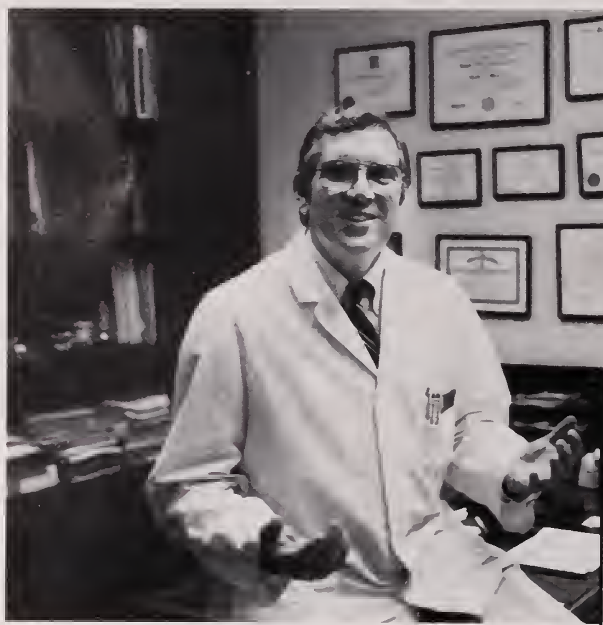

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Pyogenic Sacroiliitis

SIDNEY K. SHAPIRO, M.D., PH.D.*
and CRISPIN E. SEE, M.D.†

Two patients with pyogenic sacroiliitis are presented. The necessity for early diagnosis of this rare condition and the diagnostic features of same are emphasized and reviewed. The institution of prompt treatment minimizes the morbidity and mortality in this diseases.

Pyogenic sacroiliitis is a relatively rare condition. Gordon et al. in 1980[1] found 72 cases in the English literature and added 10 of their own. The mean age of patients reviewed in their series was 20 years with 61 percent being men. In 1980 Schaud et al.[2] surveyed the pediatric literature and added their experience in seven cases to the 71 previously reported. The patients were 17 years old or less. Infectious sacroiliitis may prove to be a difficult diagnosis unless a high index of suspicion and familiarity with this condition are entertained. We recently encountered two patients in whom the diagnosis of pyogenic sacroiliitis was established and the offending organism isolated. The clinical course of these patients will be presented and the salient features of pyogenic sacroiliitis reviewed.

Case Reports

Case 1

A 38-year-old man with a one-year history of back pain arising after an automobile accident was admitted to hospital because of the development of severe low back pain with radiation into both legs, rendering him unable to walk. Following admission to the hospital, a CT scan revealed an asymmetrical impression on the contrast filled subarachnoid space with encroachment on the right intervertebral foramen indicating a herniated disc at the L5-S1 level. A discogram was performed which revealed "at L5-S1 there is free extravasation of contrast through the area of the disc space and also free extravasation posteriorly indicating herniated disc material." The patient was treated conservatively for this disc problem but failed to respond and further investigation was carried out. A bone scan was performed 11 days after the patient's admission to the hospital revealing "a slight increase in radioactivity in the right sacroiliac articulation which is diffuse with focal increase in the true joint." Attempts were made to aspirate the right sacroiliac joint on two occasions under anesthesia by needle insertion. Only a few colonies of pseudomonas aeruginosa were grown from the second aspiration, and this was considered nondiagnostic. An open operation was carried out, and tissue was obtained from the joint. From this tissue, pseudomonas aeruginosa was cultured. The patient received an intensive course of antibiotics with tobramycin 200 mgs. IV, every eight hours for a period of four days and then 220 mgs IV, every eight hours for a period of 13 days and then 200 mgs. IV, every eight hours for a period of 20 days. Piperacillin 3 grams IV, every four hours was given concomitantly with tobramycin until five days before the termination of treatment. The patient was a known previous addict and had reverted to his addition and had been giving himself, for pain relief, intravenous drugs over a period of six months prior to admission to the hospital.

On admission to the hospital, the patient was afebrile, but the white count was elevated with a value of 15.8. The sedimentation rate was elevated with a value of 114. Following treatment of the pyogenic sacroiliitis, the patient responded in a gratifying manner, and at the conclusion of antibiotic therapy, the acute pain had subsided and the patient was ambulatory. Xrays of the right sacroiliac joint four and a half weeks following the patient's admission to the hospital revealed destruction of the right sacroiliac joint with indistinct articular markings throughout. Repeat Xray of the right sacroiliac joint three weeks later revealed haziness of the margins of the joint, but the impression was that there was some filling in that might indicate early healing and early laying down of new bone at this joint.

Comments

The difficulties in the diagnosis of pyogenic sacroiliitis are emphasized by this patient. His clinical picture was complicated by the presence of a frankly ruptured intervertebral disc, and attention was not directed initially towards the sacroiliac joint. When attention was focused on the sacroiliac joint, he showed the classical finding of marked tenderness on palpation over the right sacroiliac joint and a positive pelvic compression and Fabere sign. The source of this patient's infection was

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undoubtedly from the unsterile intravenous self-administration of drugs resulting in a hematogenous spread of infection. The ruptured disc complicated the diagnosis of and delayed the treatment of the pyogenic sacroiliitis.

Case 2

This 22-year-old woman had sustained a back injury in an automobile accident 11 months prior to the development of the acute episode which precipitated her admission to the hospital. The patient after a long bus ride developed acute low back pain with marked tenderness over the left sacroiliac joint. The blood culture was positive for Staphylococcus Aureus. A white blood cell count was normal. The sedimentation rate was 113. Routine Xrays of the pelvis and hips were negative. Stereopelvis views showed an indistinct left sacroiliac joint. Tomography showed an irregularity especially on the iliac side of the left sacroiliac joint. A radioactive bone scan showed focal intense uptake at the left sacroiliac joint. A Gallium scan showed intense uptake at the same point. A diagnosis of a pyogenic sacroiliitis was made, and the patient was treated with nafcillin and cefazolin for a total treatment course of 28 days. Intensive pain initially immobilized the patient. With treatment the patient gradually improved, and following a program of physical therapy and rehabilitation, resumed her usual activities.

Comments

There was no obvious source of this patient's Staphylococcus Aureus infection. Tomography, radioactive bone scan TcMDP, and Gallium scan were positive early in the presence of normal routine Xrays of the pelvis and hips. This underlines the necessity for bone scintigram when the diagnosis of pyogenic sacroiliitis is being considered. Localization of intense pain and tenderness over the left sacroiliac joint suggested the clinical diagnosis. The special x-ray studies and the positive blood culture established the diagnosis.

Anatomy of the Sacroiliac Joint

The sacroiliac joint is composed of opposing cartilaginous surfaces and is therefore diarthrodial. The hyaline cartilage surfaces of the joint vary in thickness from .5 to 4 mm. The joint capsule is lined primarily anteriorly by synovial membrane. The sacroiliac joint opposes the retroperitoneum. The first two sacral nerves, the superior gluteal and obturator nerves cross anterior to the joint capsule and radiation of pain, can anatomically be explained by consideration of these factors.

Either trauma or pressure produced by the collection of material in the joint cavity itself may rupture the capsule of the sacroiliac joint. Purulent material released may then follow the various paths of the least mechanical resistance. After filling the iliac fossa, pus may track along the tendon of the iliopsoas muscle to the hip or thigh with or without the development of peritonitis. It may follow the tendons of the short external rotators in the buttock or ascend to the lumbar region along the crest of the ilium. Purulent material may also penetrate the pelvic floor and discharge through the vagina or rectum.[1]

Clinical Features

Course

Infectious sacroiliitis can be of two types:[2] (1) acute sacroiliitis with sudden onset, signs of infection, and severe continuous pain exacerbated by weight bearing or any attempt at moving the sacroiliac joint, (2) subacute sacroiliitis, a rare form with slow onset, afebrile course or mild fever, less intense pain, and sometimes pain only on movement but always with signs of sacroiliac involvement.

Pain usually referred to the buttock was the principal complaint. However, some patients have poorly localized pain in the buttock and low back. Many keep themselves immobile, complaining bitterly if they are moved. Pain may radiate into the abdomen, hip, lateral thigh, and lower leg. Unilateral infection is the rule with no predilection for a particular side. A single example of bilateral infection was recorded by Gaucher and associates.[6]

Physical Findings

All of the patients have tenderness when the involved sacroiliac joint is palpated. Not infrequently (as in Case 1), this finding was overlooked during the initial examination as the patients were examined in the supine position and refused to turn over because of the marked pain being experienced. Limp was described in 94 percent of cases, and radicular sciatic pain in 39 percent. On occasion particularly in children, the leg is flexed at the hip on the involved side as if there is a contracture of the hip.

Examination usually reveals one or more of the following findings: (1) marked tenderness over the posterior aspect of the sacroiliac joint, (2) positive findings on painful stressing of the sacroiliac joint by pelvic compression or by the Gaenslen or Fabere maneuver. In the Gaenslen maneuver, the ipsilateral hip and lower extremity are hyperextended with the patient supine at the edge of the examining surface. Fabere is the acronym of *f*lexion, *ab*duction, *e*xternal *r*otation and *e*xtension. Fabere is performed on the supine patient by placing the ipsilateral lateral malleolus on the opposite knee, thus flexing, abducting and externally rotating the hip. Forceful depression of the knee transmits stress proximal to the hip and will elicit pain from an inflamed sacroiliac joint. If the Fabere maneuver is performed rapidly, movement of the sacroiliac joint will occur. If this maneuver is performed slowly, the hip may be taken through a full range of motion, (3) a full range of passive hip motion. This may be difficult in many patients, and (4) tenderness on rectal examination and to deep palpation of the lower abdomen.

Laboratory Findings

The erythrocyte sedimentation rates on admission are almost always elevated. The white blood count may be normal or elevated. Blood cultures are sterile in 50 to 60 percent of the patients.[1] The incidence of positive bacteriology rises significantly when either a needle aspiration or direct surgical intervention into the involved sacroiliac joint is made. However, in a significant number of people, 25 percent in one series,[1] the culture is sterile. In this group, bacterial etiology for sacroiliitis is suggested by the pathological study of the biopsy from the sacroiliac joint and institution of antibiotic therapy may result in a resolution of the patient's symptoms. Biopsy specimens reveal evidence of a pyogenic process whereas infections due to fungi or mycobacteria usually cause a granulomtous reaction.

The majority of organisms cultured are aerobic but anaerobic infections of the sacroiliac joint occur.[3] Commonly isolated microorganisms include Staphylococcus Aureus, pseudomonas aeruginosa, streptococci, pneumococci, escherischia coli, staph epidermidis, and other aerobic gram negative bacteria.

Underlying Disorders

Conditions predisposing to pyogenic sacroiliitis include trauma, pregnancy, infections of the skin, bone and urinary tract, endocarditis, and drug addiction. The sacroiliac joint is probably hematogenously seeded during bacteremia arising from a primary site. Pregnancy causes laxity of the sacroiliac joint and may enhance its susceptibility to hematogenous seeding. In a significant number of patients, no primary site for the infection can be demonstrated.

Radiographic Findings

Routine Xrays of the affected sacroiliac joint are usually negative when taken early. Sclerosis, lytic destruction, and eventually various degrees of synostosis were present in 95 percent of cases after two to six weeks of illness.[2] Localization of radionuclide to the sacroiliac joint on bone scintigram may be positive as early as two days following the onset of the clinical illness, and the majority are positive by the end of one week.[1,4] TcMDP is used in the majority of these studies, but the Gallium has been used to a lesser extent. Radionuclide bone scan is a sensitive modality enabling early diagnosis long before radiographic changes become apparent.[4,3] Scintigraphic findings are usually positive weeks before radiographic change and together with the clinical picture enable therapy to be started early enough to prevent joint destruction.[5] Computerized tomography has not been studied in a large number of cases in relation to the sacroiliac joint infection, but this modality may be of help in the early diagnosis of the disease.

Aspiration of Infected Sacroiliac Joints

Aspiration under general anesthesia with fluoroscopic control is an effective method of confirming the diagnosis of pyogenic sacroiliitis. Aspiration without anesthesia is prohibitively painful. The technique of aspiration of the infected sacroiliac joint has been outlined by Miskew, et al.[7] If the aspiration, however, does not prove to be successful in establishing the organism involved, surgical biopsy of the involved joint is recommended. In seven of eight consecutive patients, a positive culture following needle aspiration was obtained from the infected joint.[1,7]

Treatment

Continuous high doses of antibiotic therapy initially by the intravenous route, subsequently orally in high doses monitored appropriately until symptoms have virtually vanished is mandatory. Antibiotic therapy against resistant Staphylococcus Aureus infection should be commenced until a specific organism is identified. In the pre-antibiotic era, pyogenic infections of the sacroiliac joint resulted in a mortality rate of 30 percent. Since the availability of antimicrobial agents, no death from this disease has been reported. Recurrences were unusual and frequently resulted from inadequate therapy.[6] Long term follow-up for relapse is necessary to ascertain the adequacy of therapy. Surgery is infrequently indicated for drainage of abscesses and removal of sequestered bone. Both abscess and sequestrum represent complications of pyogenic sacroiliitis due to delayed or inadequate antimicrobial therapy. Since the days of antibiotic therapy, surgical intervention is usually unnecessary.

Differential Diagnosis

Unilateral disease is most frequently diagnosed as either septic hip joint, gonococcal pelvic infection, herniated disc syndrome, malignancy with metastasis to the spinal cord, osteomyelitis of the pelvic bone or femur, and intraperitoneal or retroperitoneal infections.

Also to be considered in the differential diagnosis are tuberculosis, osteomyelitis, ankylosing spondylitis, ulcerative colitis, Crohn's disease, rheumatoid arthritis, psoriasis, Reiter's disease, degenerative sacroiliitis, collagen vascular disease, osteitis condensans ilii, gout, familial mediterranean fever, acute bacillary dysentery, psoriatic arthritis, Still's disease, and inflammatory bowel disease.[7]

An intraabdominal and extraabdominal abscess was found in 78 percent of patients in the preantibiotic era and 22 percent of patients from the 1941 to present.[2]

Conclusions

Two patients with pyogenic sacroiliitis have been presented. An effort has been made to focus attention on the clinical features of this rare condition so that an early diagnosis of future cases may be expedited.

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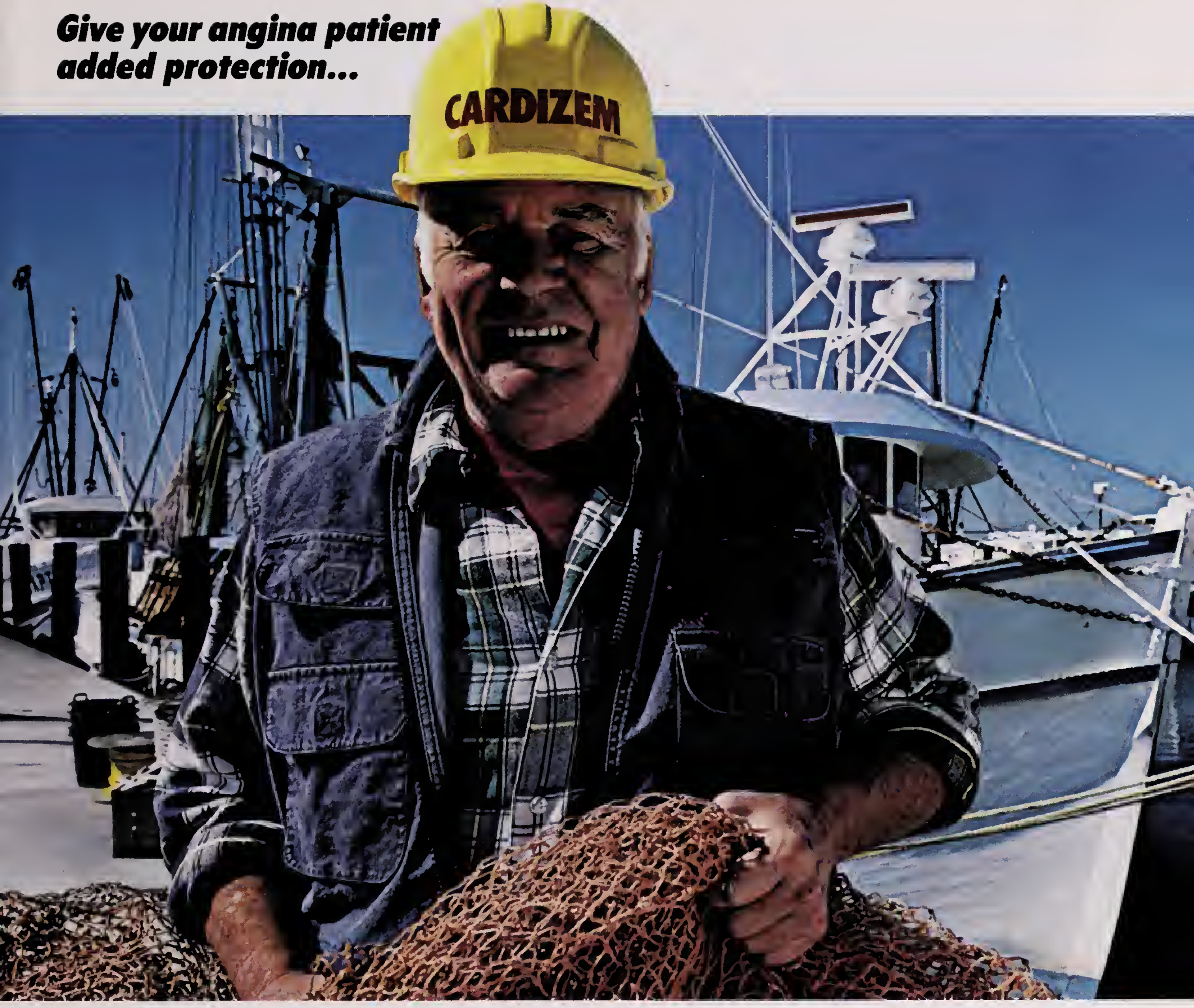

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- ***Proven efficacy when used alone in angina***[1, 4-6]
- ***Compatible with both beta-blockers and nitrates***[7]

Please see brief summary of prescribing information on the next page.

CARDIZEM® 60 mg tid or qid

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FEWER SIDE EFFECTS IN ANTIANGINAL THERAPY

BRIEF SUMMARY

CARDIZEM® (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist)

INDICATIONS AND USAGE

1. **Angina Pectoris Due to Coronary Artery Spasm.** CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm. CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks).
2. **Chronic Stable Angina (Classic Effort-Associated Angina).** CARDIZEM is indicated in the management of chronic stable angina CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance.

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities.

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt) Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited. Caution should be exercised when using the drug in such patients.
3. **Hypotension.** Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.
4. **Acute Hepatic Injury** In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes. (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes· however, these changes were reversible with continued dosing

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM (diltiazem hydrochloride) in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%), AV block (1.1%). In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence

Cardiovascular·	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope
Nervous System	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia
Gastrointestinal·	Constipation, dyspepsia diarrhea, vomiting, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH
Dermatologic·	Pruritus, petechiae, urticaria, photosensitivity
Other·	Polyuria, nocturia

The following additional experiences have been noted

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM erythema multiforme, leukopenia, and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers. In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage The following measures may be considered

Bradycardia	Administer atropine (0.60 to 1.0 mg). If there is no response to vagal blockade, administer isoproterenol cautiously
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg. dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral LD_{50}'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively The intravenous LD_{50}'s in these species were 60 and 38 mg/kg, respectively The oral LD_{50} in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity

DOSAGE AND ADMINISTRATION

Exertional Angina Pectoris Due to Atherosclerotic Coronary Artery Disease or Angina Pectoris at Rest Due to Coronary Artery Spasm. Dosage must be adjusted to each patient's needs. Starting with 30 mg four times daily, before meals and at bedtime, dosage should be increased gradually (given in divided doses three or four times daily) at one- to two-day intervals until optimum response is obtained. Although individual patients may respond to any dosage level, the average optimum dosage range appears to be 180 to 240 mg/day There are no available data concerning dosage requirements in patients with impaired renal or hepatic function. If the drug must be used in such patients, titration should be carried out with particular caution

Concomitant Use With Other Antianginal Agents:

1. **Sublingual NTG** may be taken as required to abort acute anginal attacks during CARDIZEM therapy
2. **Prophylactic Nitrate Therapy** — CARDIZEM may be safely co-administered with short- and long-acting nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.
3. **Beta-blockers.** (See WARNINGS and PRECAUTIONS.)

HOW SUPPLIED

CARDIZEM 30-mg tablets are supplied in bottles of 100 (NDC 0088-1771-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1771-49). Each green tablet is engraved with MARION on one side and 1771 engraved on the other. CARDIZEM 60-mg scored tablets are supplied in bottles of 100 (NDC 0088-1772-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1772-49). Each yellow tablet is engraved with MARION on one side and 1772 on the other Issued 4/1/84

See complete Professional Use Information before prescribing

0642T5

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Diagnosis of Renal Injury with Computed Tomography

J. VIEIRA, M.D.*, C. S. SMITH, M.D.*,
A. S. CASS, M.D.*, P. GLEICH, M.D.*,
and P. L'HEUREUX, M.D.*

Excretion urography has been the traditional radiographic study for the evaluation of renal trauma from external injury. With major renal injuries the IVP findings are often indeterminate in making the diagnosis. Computed tomography has increased the accuracy of diagnosing all types of renal injuries with the exception of renal artery injury which was diagnosed by renal arteriography.

The evaluation of renal injury by excretion urography has resulted in a significant number of indeterminate findings especially with the major renal injuries (laceration, rupture). Further radiologic studies (isotope, arteriography) or renal exploration are required to diagnose the type of renal injury. Computed tomography has clearly defined renal parenchymal injuries, hematoma formation and extravasation of urine with dye and increased the accuracy of diagnosing renal injuries. There have been a small number of indeterminate findings with CT including renal artery injury which was diagnosed by renal arteriography.

Indications for Radiographic Evaluation

The presence of macroscopic or microscopic hematuria after external trauma is the primary indication for radiographic evaluation. Other indications are a perirenal hematoma found during a laparotomy for intra-abdominal injury, fracture of the transverse processes of lumbar vertebrae, rapid deceleration injury or pain, tenderness of bruising of the flank or lateral abdomen.

Types of Renal Injury

Contusion - bruise or subcapsular hematoma with an intact renal capsule.

Laceration - disruption of the renal parenchyma and of the renal capsule with perirenal hematoma.

(a) cortical laceration - superficial and not involving the calyceal system or the deep renal medulla.

(b) deep laceration - involving the calyceal system or the deep renal medulla. Includes the split or fractured kidney.

Rupture or shattered kidney - multiple deep lacerations to the kidney. Pedicle injury - occlusion or rupture of the renal artery, renal vein or their branches.

Radiographic Findings

Excretion Urography

With renal contusion the IVP findings are usually normal although incomplete filling of the calyces or delayed visualization is often found. With renal laceration or rupture, extravasation is often seen but incomplete filling or delayed visualization is usually found and these findings are indeterminate. With renal artery injury nonvisualization is present.

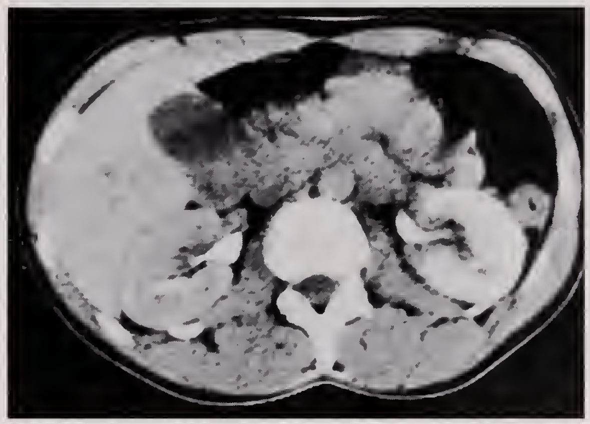

Figure 1 (A)

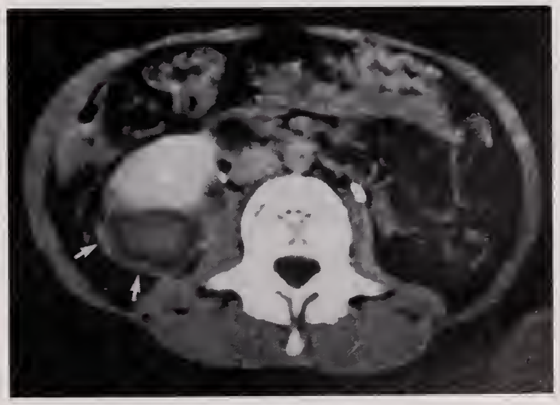

Figure 1 (B)

Fig.1-Renal Contusion (A) Contrast extravasation into the interstitial space of the renal parenchyma of left kidney (B) Subcapsular hematoma with an enhanced rim (white arrows) indicating the age of the hematoma.

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Computed Tomography

In renal contusion there is contrast extravasation with urine and blood into the interstitial space of the renal parenchyma without compromise of parenchymal perfusion (Figure 1(A)). A subcapsular hematoma may be present and develop an enhanced rim indicating the age of the hematoma (Figure 1(B)).

With renal laceration there is a defect in the renal parenchyma. A cortical laceration is superficial (Figure 2(A)) while a deep laceration extends into the deep renal medulla (Figure 2(B)). A perirenal hematoma of varying size is usually present (Figure 2(C)). A deep laceration involving the calyceal system results in extravasation of the contrast medium.

Renal rupture or shattered kidney shows multiple deep lacerations to the kidney with extravasation and perirenal hematoma (Figure 3).

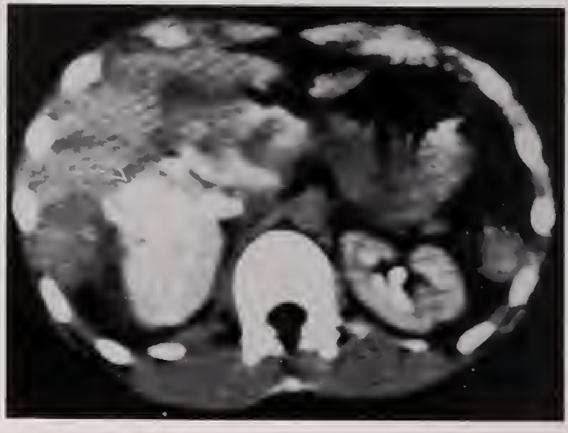

Figure 3 (A)

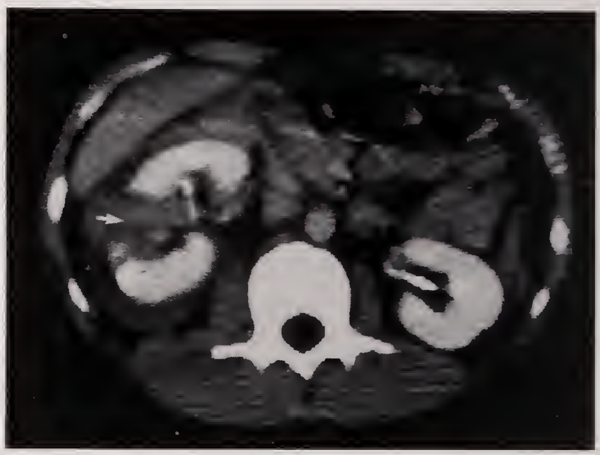

Figure 3 (B)

Fig.3-Renal Rupture or shattered kidney. Multiple deep lacerations (white arrows) with extravasation (curved open white arrow) and perirenal hematoma (open white arrow) at (A) 180 mm. (B) 200 mm. from the dome of the diaphragm.

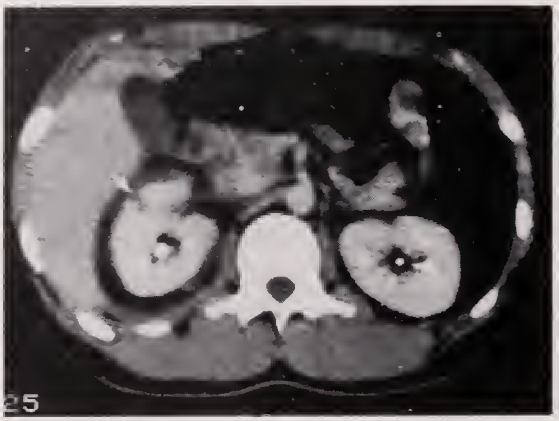

Figure 2 (A)

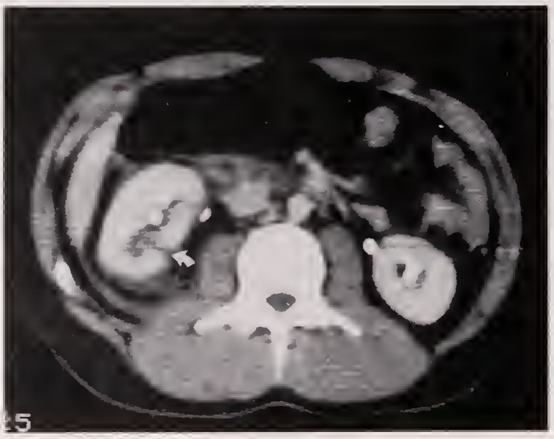

Figure 2 (B)

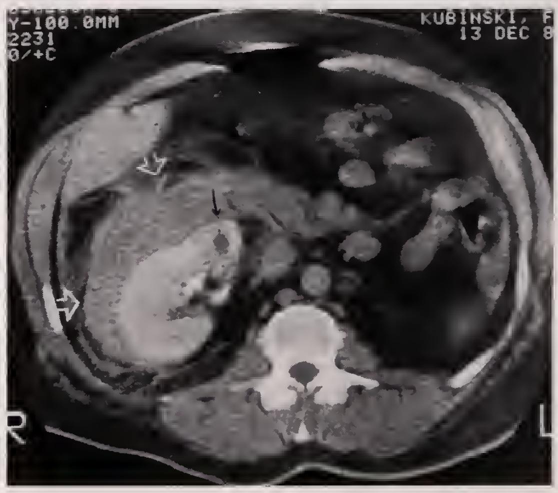

Figure 2 (C)

Fig.2-Renal Laceration (A) Cortical or superficial laceration (white arrow) (B) Deep Laceration - extending into renal medullary region (curved white arrow) (C) Deep laceration (black arrow) with perirenal hematoma (open white arrow).

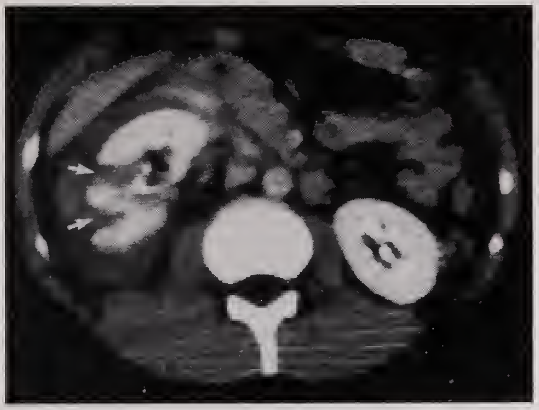

Figure 3 (C)

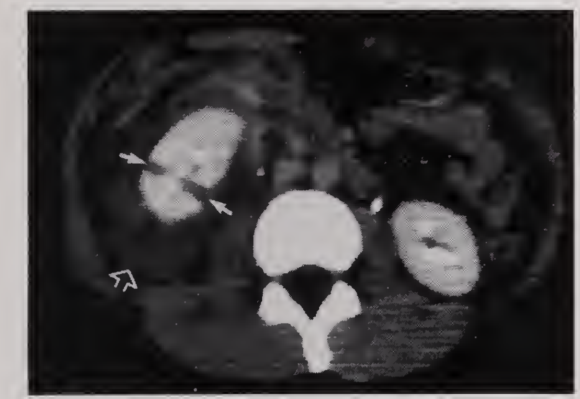

Figure 3 (D)

Fig.3-Renal Rupture or shattered kidney. Multiple deep lacerations (white arrows) with extravasation (curved open white arrow) and perirenal hematoma (open white arrow) at (C) 220 mm. (D) 230 mm. from the dome of the diaphragm.

Discussion

The diagnosis of the type of renal injury should be known before a decision is made on its management. The IVP has been the traditional radiologic study used to diagnose renal injury. Increased accuracy in diagnosing renal injury has been reported using renal angiography[1,2] and CT.[3-6]

Several studies have compared IVP and CT findings in patients with renal injury.[3,5,6,7] The IVP findings are indeterminate in a significant number of patients especially with the more severe degrees of renal injury. The CT gave a definite diagnosis in almost all cases of renal injury with the exception of renal artery injury. Lang reported that serious vascular injury was missed in CT in five of seven patients.[6]

The IVP is being used as a screening radiographic study in patients suspected of having renal injury with the CT or renal arteriography as subsequent radiographic studies if the initial IVP gives indeterminate findings or shows nonvisualization respectively. However, with the increased accuracy of CT in diagnosing the exact nature and extent of the renal injury consideration should be given to performing the CT as the initial radiographic study. If no parenchymal perfusion or enhancement is seen on CT, suggesting renal artery injury, a renal arteriogram should be performed.

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AMI

Acquired Immunodeficiency Syndrome

Recommendations to Prevent Transmission for Hospitals and Health Care Workers

KENT CROSSLEY, M.D., and MMA TASK FORCE ON AIDS*

In the early months following recognition of the illness which we now term the acquired immunodeficiency syndrome (AIDS), it was evident that several groups (notably male homosexuals and intravenous drug abusers) were at particularly high risk for acquiring this disease. What has proven to be a relatively accurate understanding of the epidemiology of infection with the AIDS virus was in place before the etiology of the syndrome was recognized. Early in the outbreak, the Centers for Disease Control began to issue information about appropriate precautions in the hospitals and about the risk of transmission.[1] Similar recommendations were developed and published by the American Hospital Association and by the University of California, San Francisco.[2,3]

Virtually all of these and subsequent guidelines have centered on the same two key epidemiologic points: Firstly, although AIDS virus is present in a number of different bodily fluids, infection appears to be only transmitted by contact with blood or semen. Secondly, the likelihood of transmission occurring following exposure to blood is very low.

Even though information about the relatively low risk of acquisition of this disease by health care workers has been available for several years, misunderstanding and inappropriate fears persist. This has been a particular problem among paramedical personnel but has also been an issue for physicians. The press has reported paramedic groups buying "space suits" to prevent potential contamination from AIDS virus-infected individuals. Similar stories—like the recent report that Washington, D.C. health workers refused to transport the body of an AIDS victim to a morgue—appear almost weekly. The same kinds of situations have occurred in Minnesota. We are aware of local surgeons who have refused to operate on patients who are known to be HTLV-III positive. It is also our impression (although the Task Force does not have extensive data) that some dentists in Minnesota have refused to treat patients with AIDS virus infection.

Given the publicity which has accompanied episodes of refusal to provide health care to AIDS patients, the fear which has extended to the general population is perhaps understandable. Although recent polls suggest Minnesotans are relatively well informed, many Americans believe that this illness may be transmitted by casual contact. Exclusion of children from school, loss of employment and biases in providing housing and hospice care are obvious examples of the results of misunderstandings about the transmission of this disease.

A large quantity of data has accumulated to indicate that HTLV-III infection is not easily transmitted to those outside the recognized high-risk groups. A number of studies have examined the risk of transmission to household contacts of AIDS-infected individuals. Last month, for example, information about 101 household contacts of 39 AIDS patients was reported.[4] All of these contacts (68 children and 33 adults) had lived in the same household with a patient with AIDS or AIDS-related complex for at least three months; none had sexual exposure to the AIDS virus infected individual. The contacts had shared household utensils and had close personal contact with the infected person for a median of 22 months. Only 1 of 101 household contacts had evidence of infection with the AIDS virus. This contact was a five-year-old child who was thought to have been infected at the time of birth rather than through household contact.

The Minnesota Department of Health has summarized data from eight other studies which have examined transmission of HTLV-III virus among family contacts of infected individuals.[5] These investigations included some 3215 family contacts. In none of the studies were contacts found to be HTLV-III antibody positive unless they were otherwise at high risk (i.e. sexual partners of infected individuals, intravenous drug abusers or children born to infected mothers).

There are a substantial number of studies which have analyzed the risk of transmission of the AIDS virus within health care facilities. Recommendations to prevent transmission of infection in the work place have recently appeared in Morbidity and Mortality Weekly Report.[6] In early 1985, information about a group of 85 employees with nosocomial exposure to AIDS patients was published. Employees included in the study were those who had had accidental inoculations with needles from patients with AIDS and endoscopists, surgeons and researchers with repeated exposure to specimens from AIDS patients.[7] No antibody to the HTLV-III virus was found in any of the health care workers. A subsequent study published in the fall of 1985 examined 361 clinical and laboratory employees at several institutions who had been exposed to the AIDS virus.[8] Three employees who were not members of recognized high-risk groups were HTLV-III antibody positive. In none of these individuals was there clear evidence of acquisition of infection within the hospital setting. CDC has summarized information about 1,758 health care workers with nosocomial exposure to blood of AIDS patients. Twenty-six of this group had antibody and all but three were members of high-risk groups (two of these three cases are included in the three reported by Weiss, et al.)[9]

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*Members include: Mike Daly, M.D., Minneapolis; Mark Eckman, M.D., Duluth; Robert Gruninger, M.D. (co-chairman), Minneapolis; Brooks Jackson, M.D., Minneapolis; Warren Regelmann, M.D., Minneapolis; Scott Strickland, M.D., Minneapolis; David Williams, M.D., Minneapolis and Kent Crossley, M.D., St. Paul (chairman). Valentine O'Malley and Michael Osterholm, Ph.D., M.P.H. are ex officio members.

Only one well-documented episode of needle stick transmission of HTLV-III infection has been documented. A nurse in England sustained a needle stick injury with injection of blood from an AIDS patient under her skin. She was HTLV-III antibody negative immediately after the incident and antibody positive when retested several months later.[10] Only cases who are HTLV-III antibody free at the time of needle stick injury can be assumed to have acquired HTLV-III infection as a result of nosocomial exposure.

Recommendations for prevention of transmission of the virus in the work place reemphasize the similarity between HTLV-III infection and hepatitis B virus infection. Hepatitis B virus infection is clearly more communicable than HTLV-III infection. The risk of acquiring HBV following a needle stick ranges from 6-30% Following needle stick injury to a patient infected with HTLV-III virus, the risk of acquiring infection is much less than 1%. The CDC recommendations for health care workers strongly emphasizes that general infection control precautions used to prevent transmission of blood-borne disease will prevent transmission of HTLV-III infection. The CDC further suggests that students and house staff should be educated about "the epidemiology, modes of transmission and prevention of HTLV-III infection."[6]

Specific recommendations to prevent acquisition of HTLV-III infection by health care workers include extraordinary care in handling sharp items and the use of puncture-resistant containers for disposal of syringes, needles, scalpel blades and other sharp items. Wearing gloves, gowns (and occasionally masks and goggles) when at risk of exposure to blood is generally recommended. Thorough handwashing if blood exposure should occur is emphasized. Ventilation devices which avoid the use of mouth-to-mouth contact ought to be available throughout institutions caring for patients who are HTLV-III positive. Special emphasis is placed on informing pregnant health care workers of the risk of perinatal transmission of infection.

The Task Force believes that these recommendations largely translate into use of common sense in handling blood or body fluids from any patient. We believe that particular emphasis on the proper handling of sharp objects, institutional review of precautions for avoiding needle stick injury and reassessment of the adequacy of devices for disposal of needles and other sharps is particularly important at this time.

The CDC has recently reported transmission of HTLV-III virus from a 24-month-old male with congenital intestinal abnormalities to his mother.[11] The child became infected with HTLV-III by blood transfusion. The mother (who had been trained as a paramedic) was serologically negative when tested during blood donation early in the child's illness and was found to be positive at the time of later blood donations. Although there was no obvious needle stick injury, the mother had been extensively involved in the child's care during hospitalization and at home and was frequently exposed to blood and other body fluids. We believe that this case only reemphasizes the need for wearing gloves during contact with blood or body fluids from patients who are HTLV-III positive.

Recommended isolation for individuals who are HTLV-III positive within health care facilities has been extensively discussed. The use of "blood precautions" is widely endorsed. It is generally recommended that health care givers wear gloves for direct contact with body fluids and a receptacle for sharp objects be placed in the patient's room. Gowns may be used if staining with blood is likely. Many institutions do not recommend use of mouth-to-mouth resuscitation for HTLV-III infected patients.

Patients with the acquired immunodeficiency syndrome may need additional isolation because of other infections. Thus, a patient with active Mycobacterium tuberculosis infection of the lung would require both respiratory isolation and blood precautions. Other kinds of isolation appropriate for various opportunistic infections may be in order.

Copies of information about work place transmission and samples of isolation policies for use in hospitals may be obtained through the Minnesota Medical Association.

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Ninth Annual Black Hills Seminar

The Ninth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 18, 19 and 20, 1986, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include: Drs. James Corrigan, Jerome Klein, George Little, and Lynn Taussig. For complete conference information contact:

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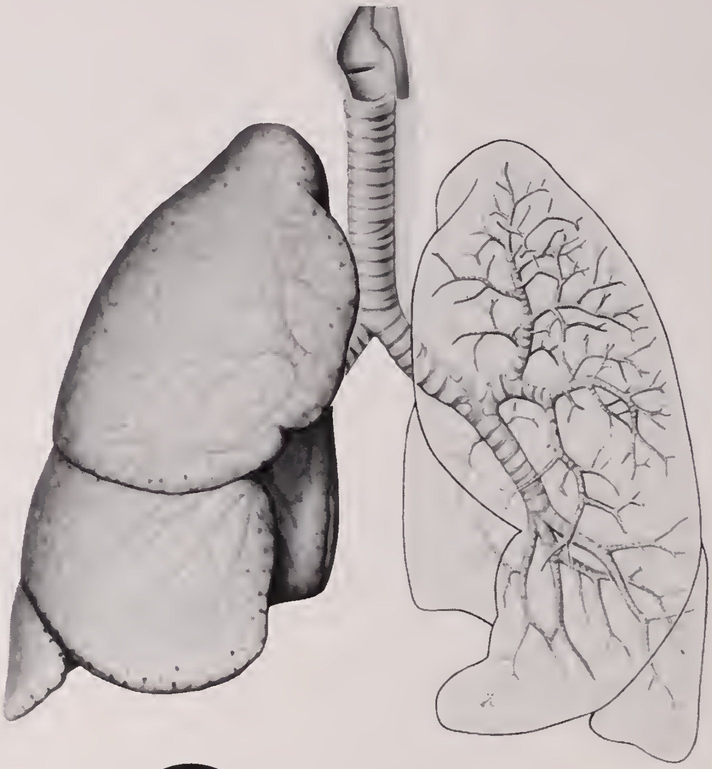

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Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Ceclor.

Contraindication Ceclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY. THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Antibiotics, including Ceclor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions *General Precautions* – If an allergic reaction to Ceclor® (cefaclor, Lilly) occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Ceclor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Ceclor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Ceclor, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clinitest® tablets but not with Tes-Tape® (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy – Pregnancy Category B – Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Ceclor® (cefaclor, Lilly). There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers – Small amounts of Ceclor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one hour. The effect on nursing infants is not known. Caution should be exercised when Ceclor is administered to a nursing woman.

Usage in Children – Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions. Adverse effects considered related to therapy with Ceclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthralgia and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Ceclor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.

Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain – Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic – Slight elevations in SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematopoietic – Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal – Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

[061782R]

Note Ceclor® (cefaclor, Lilly) is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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* WARNING

This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired.** If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of Dyrenium (triamterene, SK&F CO.) and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function.

Thiazides may add to or potentiate the action of other antihypertensive drugs.

Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

Supplied: 'Dyazide' is supplied as a red and white capsule, in bottles of 1000 capsules; Single Unit Packages (unit-dose) of 100 (intended for institutional use only); in Patient-Pak™ unit-of-use bottles of 100.

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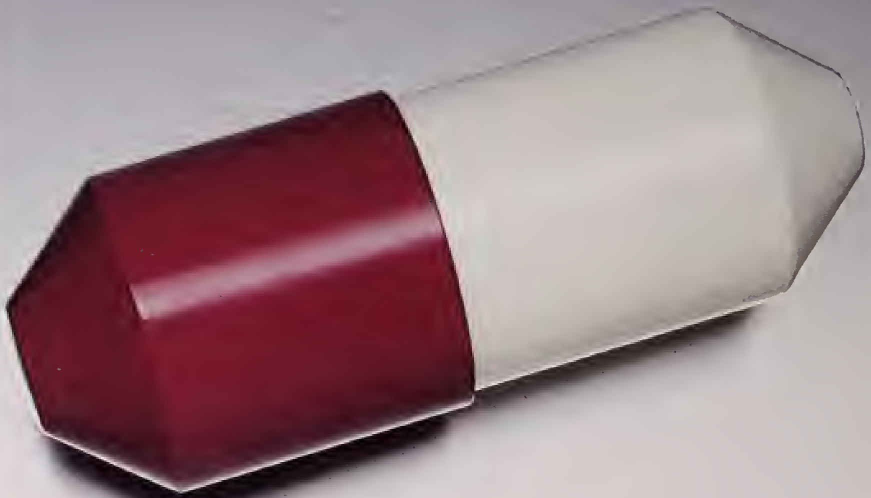

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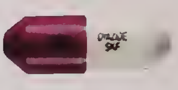

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Report on Organ Transplantation and Other Innovative Therapies

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Organ Transplantation - Issues

I. *Project Overview*

Development and use of costly and innovative therapies raise new and perplexing questions as to the appropriate distribution and allocation of finite dollars and resources within the health care system. Although organized medicine may not be the only forum in which these questions should be raised and examined, it does provide a valid and important perspective which should not be excluded when discussion of these issues occurs.

Circumstances occurring within Minnesota relating to the implementation of third party coverage for certain organ transplantation procedures led to the development of a series of questions by organized medicine regarding the scope and impact of this new benefit structure. The charge to the Subcommittee on Medical Practices which resulted from these questions being raised was expressed as follows:

> To review the issue of organ transplantation from a broad perspective, including donor, recipient and payer issues and social, ethical and economic implications.

Considerable difficulty was experienced in developing an appropriate and effective method for studying these issues and formulating reasonable and useful recommendations. Initial review of the work of other similar bodies studying similar issues led to the conclusion that a pragmatic, hands-on approach was necessary. One factor which influenced this decision was the report from the Massachusetts Task Force on Organ Transplantation.[1] This group, which included representatives from all sectors involved in providing or funding organ transplantation as well as other community leaders, developed a theoretical position which embraced a phase-in method for organ transplant programs in order to study process and outcome over time. Unfortunately, by the time this report was issued, organ transplant programs were proliferating in Massachusetts and Massachusetts Blue Cross and Blue Shield had already implemented group insurance coverage for most transplant procedures.

As this situation was occurring, the dramatic baboon heart implantation was done in Loma Linda, California and Dr. Peter DeVries was moving his artificial heart program from Utah to the privately-owned, for-profit Humana Hospital in Nashville, Tennessee. All of these occurrences served to reinforce the strong perception that new therapies were being introduced and publicly accepted without being subjected to the same rigorous process of scrutiny usually applied to procedures which are still in the experimental stage. An offshoot of this has been the acceptance by third party payers, including governmental programs, of responsibility for reimbursement for at least some of these procedures, and a perception on the part of the general public that all procedures subject to third party coverage have moved past the experimental stage and into the stage of full clinical acceptance.

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[1] Report of the Massachusetts Task Force on Organ Transplantation. October, 1984.
Reprints available through: Department of Public Health, Commonwealth of Massachusettes, 150 Tremont Street, Boston, MA 02111.

Review of these issues from a national perspective has focused on the donor organ availability as well as allocation of these scarce organ resources. Federal legislation has recently resulted in the formulation of a National Organ Transplant Task Force to study these issues and to report back on the results starting in the fall of 1985.

In addition to the issues of experimental use, clinically accepted designation, implementation of third party coverage for new and costly therapies and allocation of scarce resources, an additional focus was the question of market and media forces as they affected providers and insurers. In this instance, there seemed to be a clear connection between strong media support for coverage of innovative therapies as in the case of Jamie Fiske, whose liver transplant was finally paid for by Blue Cross and Blue Shield of Massachusetts, and the decision by insurers to increase benefit programs to cover these kinds of procedures. The impact of market forces and media involvement upon transplant centers was less clear although there seemed to be a connection.

A result of all of these discussions and this examination of organ transplantation from such diverse perspectives was the realization that there were no easily accessible answers to any of the questions being raised. In order to try to determine whether any answers could be ascertained a survey questionnaire was developed using as its base the core questions regarding cost, coverage, utilization, and public perception which had been originally posed by organized medicine. During the late summer and fall of 1985 the survey instrument was forwarded to the following three groups:

- National Organ Transplant Task Force Members,
- Third Party Payers doing significant business in Minnesota and
- Local and national organ transplant centers.

The combined results of this survey are appended to this report.

II. *Conclusion*

There is a paramount need for information on outcomes of organ transplantation procedures and other costly and innovative therapies to be maintained in a timely, scientific fashion. It is also critical that this information be made publicly available. This need is reflected by the questions originally posed by members of organized medicine and is reinforced by the results of the survey questionnaire which reflect a wide discrepancy between anticipated utilization of these procedures by insurers as opposed to projected number of procedures anticipated to be done by providers. As such procedures are designated clinically accepted it is conceivable that demand will grow. Costs may rise and there may be a shortfall in the ability of third party payers to meet the demand. This situation could unfavorably affect the allocation of other medical resources, damage the reputation of the medical profession and lead to greater regulation of both providers and insurers.

The questionnaire responses reflect a belief that a forum for collecting and providing information is appropriate and that organized medicine should play a significant part in that effort. An area of disagreement uncovered by the questionnaire is the discrepancy between what transplant centers and reimbursers think about who should collect information and make decisions on cost and allocation of resources. Clearly, the expression by transplant centers of their belief that all decision making belongs within their unilateral domain raises questions as to their perception of their responsibility for public accountability. Given these circumstances, only one conclusion can be drawn, that a multi-member, publicly accountable group which reflects diverse interests including payers, providers and patients, must be formed to act as collector, repository and disseminator of information on process, outcome, cost and utilization of these new therapies.

III. *Recommendations*

- That the Minnesota Medical Association become involved in efforts with other organizations to develop a statewide central organization of groups interested in or affected by issues relating to implementation of costly and innovative therapies with the purpose of resolving the significant data issues which exist today.
- That the MMA carefully monitor developments which result from research, recommendations and policy pronouncements by the National Organ Transplant Task Force and their bearing on statewide activities.
- That these actions be forwarded to the AMA for review and implementation on a national basis.

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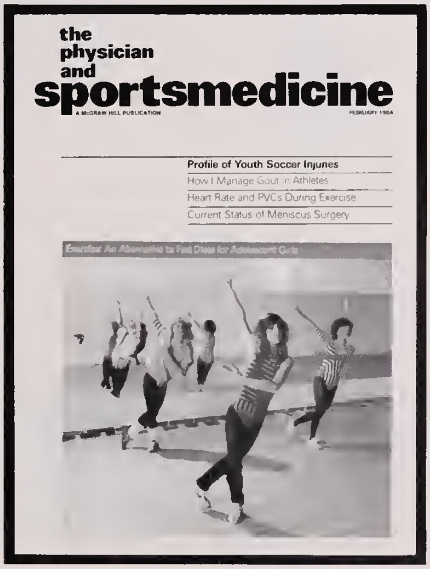

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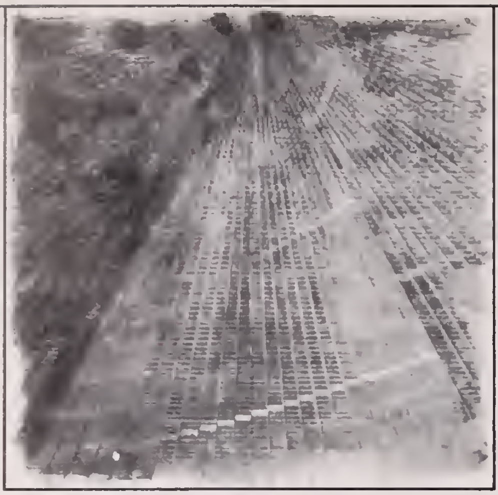

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Minnesota Medical Association
Subcommittee on Medical Practices
Organ Transplant Questionnaire

Combined Results of Survey Questionnaires completed by:

National Task Force on Organ Donation (NTF)
Third Party Payers (TPP)
Organ Transplant Centers (OTC)

1. **What mechanisms are in place within your organization/institution to allow public access to your most current organ transplant results?**
   NTF - No formal mechanisms exist for organized compilation and distribution of transplant results.
   NTF - This group deferred to Organ Transplant Centers as the appropriate source of information.
   OTC - No formal mechanisms exist for organized compilation and distribution of transplant results.

Comment

No specific opposition to divulging information was noted, in fact, most transplant centers indicated that information was available. However, no generally applied method for systematic and uniform collection and dissemination of information about process, outcome and cost currently exists.

2. **Does your organization/institution believe that marketplace pressures have an influence on the functioning of your organ transplant program?**
   NTF - No consensus
   TPP - The majority of responding reimbursers felt pressure from the marketplace was a factor.
   OTC - The majority of responding Organ Transplant Centers felt pressure from the marketplace was a factor.

Comment

It seems clear from the responses that market factors will influence transplantation decisions, both made by Organ Transplant Centers and third party payers.

3. **How would your organization/institution respond to the problem of prohibitive cost increases occurring for certain procedures now included in your Organ Transplant Program?**
   NTF - Would have to limit or curtail programs if costs became prohibitive and third party or public funding was not available.
   TPP - Insurers would limit coverage, increase premiums or fund less expensive providers.
   OTC - Would have to limit or curtail programs if costs became prohibitive and third party or public funding was not available.

Comment

This response indicates that curtailing or retrenchment of programs due to unforeseen cost increases is indeed a possibility. At issue are raised public expectations regarding the availability of previously covered services.

4. Does your organization/institution perceive the Organ Transplant Programs as generating favorable publicity?

NTF - yes
TPP - Mixed response; positive, negative and neutral.
OTC - yes

Comment

Given the fact that there is no easily accessible mechanism to assess outcome, increasing competition in the marketplace may generate publicity which could lead to a proliferation of transplant programs with a potential for overall increase in cost and loss of quality.

Favorable publicity may lead competing health care programs and/or institutions to implement new organ transplant programs. Given the current lack of availability of performance data a proliferation of transplant programs could result in increased costs and loss of quality.

5. How many transplants does your organization/institution expect to perform/pay for this year?

	Heart	*Liver*	*Pancreas*
NTF	10-50	30-200	10-35
TPP	1-12	1-5	1-2
OTC	0-50	0-30	0-30

Next Year	*Heart*	*Liver*	*Pancreas*
NTF	12	4-40	2-40
TPP	1-12	1-7	0-3
OTC	0-60	0-50	0-40

Five Years From Now

	Heart	*Liver*	*Pancreas*
NTF	20	20	20
TPP	0-5	2-5	1-7
OTC	0-70	0-70	0-70

Ten Years From Now

	Heart	*Liver*	*Pancreas*
NTF	20	100	20
TPP	0-6	2-8	0-10
OTC	0-100	0-100	0-100

Comment

There is a major discrepancy between the perceptions of third party payers and organ transplant centers in expected growth in the number of procedures to be performed.

Insurers are basing predictions on projected numbers of available organs while transplant centers are anticipating what amounts, in some cases, to exponential growth.

6. **Has your organization/institution made plans to accommodate higher than expected demand for organ transplantation?**

NTF - All organ transplant centers have made plans for greater than anticipated growth.
TPP - In general, insurers have not made plans to accommodate higher demand than anticipated.
OTC - All organ transplant centers have made plans for greater than anticipated growth.

Comment

These responses reinforce the information illustrated in question 5 that insurers' expectations of potential cases of organ transplantation are unrealistically low while organ transplant centers have, in some cases, planned for aggressive expansion of their programs.

7. **Would your organization/institution consider organized medicine to be an appropriate forum for collection and exchange of information on organ transplantation or other innovative therapies?**

NTF - Yes, with appropriate scientific direction from experts in the field.
TPP - Yes
OTC - Yes, with appropriate scientific direction from experts in the field.

Comment

General consensus on this question was that organized medicine should play a significant role in information collection and distribution.

8. **If you are an institution providing organ transplantation services, how will your institution recoup costs not directly covered by third party payers?**

NTF - The recipient is responsible for charges.
TPP - Not applicable.
OTC - The recipient is responsible for charges.

Comment

The overall response indicated that providers perceive the recipient as responsible for charges incurred in the course of treatment.

If insurance coverage is not available then private, charity or public funds will be sought. If coverage is insufficient it will mean that either the public will pay for the shortfall, or that cost shifting will occur.

9. **If you are a third party payer, are you concerned about the potential for anti-selection by individuals needing transplantation services?**

NTF - NA
TPP - Yes
OTC - NA

Comment

Insurance Companies and other third party payers indicated concern about the potential for anti-selection, however, there were many comments indicating that third party payers were confident that safeguards against anti-selection would be or were already effective. These included the fact that other carriers were also covering organ transplant services, general principles of risk-spreading and pre-existing condition coverage limitation clauses.

10. **If you are a third party payer, do you currently offer organ transplantation coverage?**
    TPP - In general yes, with some stipulations.

Comment

This response should be looked at in conjunction with responses to questions 5 and 6.

11. **In the opinion of your organization/institution, who should make decisions about costs, coverage and criteria for availability for potential transplant patients?**
    NTF - In general endorsed a team approach.
    TPP - In general endorsed a team approach.
    OTC - Organ transplant centers saw themselves as the sole decision maker on all three levels.

Comment

There is a great discrepancy in the perception of who should be developing criteria as well as making cost and coverage decisions. The response of the organ transplant centers raises some worrisome questions about whether they see themselves as publicly accountable for these decisions. Information on cost, use and projected use forwarded by the University of Pittsburgh's transplant surgeon, Dr. Thomas Starzl indicates the kind of information which could and should be available from all transplant centers as readily as it was from this one.

12. **What are the biggest problems, issues or challenges facing your organization/institution in heart, liver and/or pancreas transplantation today?**
    NTF and OTC - The biggest problems are adequate funding and availability of donor organs.
    TPP - Third party payers listed a broad array of responses which included:
    - lack of predictability of results.
    - keeping abreast of the 'state of the art' by maintaining current and consistent scientific transplant documentation.
    - incidence of transplantation, costs and the medical appropriateness of a given transplant.

Comment

There is once again a discrepancy between providers and payers as to what the significant problems and challenges are. Insurance information on process and outcome is sorely lacking while transplant centers are concerned about cost and donor availability.

Taken in conjunction with question 1 in which third party payers generally concede responsibility for information gathering and dissemination to organ transplant centers there seems to be potential for serious problems. We believe that the analysis of outcomes is a vital step which must proceed in conjunction with funding of transplantation.

13. Does your organization/institution consider heart, liver or pancreas transplantation to be either investigative or clinically accepted?

NTF
and
OTC - Heart and liver transplantation is clinically accepted. Pancreas still remains investigative.
TPP - No clear-cut definitions were given. In most cases third party payer noted that they would investigate each case individually rather than impose specific guidelines.

Comment

It is clear that heart and liver transplantations are universally considered to be clinically accepted, while pancreas transplants remain in the investigative category.

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CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

APRIL, 1986

April 17-May 16 **Advanced Cardiac Life Support Certification;** St. Francis Regional Medical Center, Education Department. St. Francis Regional Medical Center; Shakopee, Minnesota. CONTACT: Judy Hoff; Program Director; St. Francis Regional Medical Center; 325 West Fifth Avenue; Shakopee, Minnesota 55379. 612/445-2322.

27-30 **Treating the Juvenile Sexual Abuse Perpetrator: A National Training Conference; Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

28-May 2 **Family Practice Review: Update 1986** CME, Medical School, University of Minnesota; Radisson St. Paul Hotel, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

29 **Smoke-Free Hospital Workshop** Minnesota Coalition for a Smoke-Free Society 2000; Rochester, Minnesota. CONTACT: Judy Knapp, Project Coordinator, University of Minnesota; 611 Beacon Street S.E.; Minneapolis, Minnesota 55455. 612/376-2456

April 28-May 2 **Practice of Internal Medicine** Mayo Clinic, Mayo Foundation, Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street Southwest, Rochester, Minnesota 55905. 507/284-2085.

April 30-May 2 **133rd Annual Meeting & Scientific Program** Minnesota Medical Association; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Eugenia C. Kassar, Director, Department of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. 612/378-1875.

MAY, 1986

2-3 **Genetics Counseling for the Primary Care Physician** Abbott Northwestern Hospital; Registry Hotel, Bloomington. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

2-3 **Second Annual Meeting of the Minnesota Orthopaedic Society** Minnesota Orthopaedic Society; University Radisson Hotel, Minneapolis. CONTACT: James Rand, M.D.; Mayo Clinic; Rochester, Minnesota 55905. 507/284-2511.

2-3 **Allergy-Pulmonary Review Course-1986** Park Nicollet Medical Foundation, Naegele Auditorium, Park Nicollet Medical Center. CONTACT: Elaine Anderson; Park Nicollet Medical Foundation; 5000 West 39th Street; Minneapolis, Minnesota 55416. 612/927-3703.

7-9 **World Med 1986: International Health Care Congress** CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

7-9 **44th Annual Course in Allergy and Clinical Immunology** CME, Medical School, University of Minnesota; Civic Center, 143 West 4th Street, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

10 **Allergens: A Clinical Update** CME, Medical School, University of Minnesota; 2-690 Moos Tower, University of Minnesota, 515 Delaware Street S.E., Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

14-15 **Human Aging IX: Health Maintenance and Wellness;** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

15 **Changing Profiles in Clinical Toxicology.** St. Paul-Ramsey Medical Center, Hennepin County Medical Center, Minneapolis. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

17 **The Menopausal Woman** Park Nicollet Medical Foundation, Naegele Auditorium, Park Nicollet Medical Center. CONTACT: Elaine Anderson; Park Nicollet Medical Foundation; 5000 West 39th Street; Minneapolis, Minnesota 55416. 612/927-3703

19 **Smoke-Free Hospital Workshop** Minnesota Coalition for a Smoke-Free Society 2000; Marshall, Minnesota. CONTACT: Judy Knapp, Project Coordinator; University of Minnesota; 611 Beacon Street S.E.; Minneapolis; Minnesota 55455. 612/376-2456.

20 **Symposium on Gynecologic Oncology** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21-23 **Current Concepts in Radiation Therapy** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

22 **Smoke-Free Hospital Workshop** Minnesota Coalition for a Smoke-Free Society 2000; Moorhead, Minnesota. CONTACT: Judy Knapp, Project Coordinator; University of Minnesota; 611 Beacon Street SE; Minneapolis, Minnesota 55455. 612/376-2456.

May (continued)

27 **Pediatric Infectious Disease: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center; 2525 Chicago Avenue South; Minneapolis. Contact; Darleen Papin; 2525 Chicago Avenue South; Minneapolis, Minnesota 55404. 612/874-6194.

30-31 **Symposium on Gay & Lesbian Adolescents** CME, Medical School, University of Minnesota. Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

JUNE, 1986

2-3 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building; 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

4 **Option in Cardiovascular Medicine** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-7 **15th Annual Workshops on Clinical Hypnosis-Introductory & Advanced** CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-8 **Surgery for Primary Care** CME, Medical School, University of Minnesota, Craguns Resort, Brainerd, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street, Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

13-15 **Minnesota Thoracic Society Annual Scientific Meeting** Minnesota Thoracic Society; Madden's Resort; Brainerd; Minnesota. CONTACT: Scott F. Davies, M.D.; Department of Medicine; Hennepin County Medical Center; 701 Park Avenue South, Minneapolis, Minnesota 55413. 612/347-2705.

13-14 **Hospital Nutrition Support** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnersota. CONTACT: Office of CME, Box 2023 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota. 55455. 612/373-8012.

18-21 **50th Annual Surgery Course: Trauma & Critical Care Surgery CME, Medical School** CME, Medical School, University of Minnesota, Willey Hall and Amfac Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21 **Minnesota Obstetrical and Gynecological Society Spring Meeting 1986** Minnesota Obstetrical and Gynecological Society; St. James Hotel, Red Wing, Minnesota. CONTACT: T.M. Julian, M.D., Box 395 Mayo Building, Minneapolis, Minnesota 55455. 612/373-4043.

23-24 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

25-27 **Topics and Advances in Pediatrics** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

July 31-August 2, 1986 **Third Annual St. Paul-Ramsey Trauma Conference;** St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, WI: CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3980.

JULY, 1986

7-9 **Orthopaedic Surgery: Shoulder** CME, Medical School, University of Minnesota; Hyatt Regency Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

17-20 **Multidisciplinary Conference on Cardiovascular Disease: Patient Problems** Abbott Northwestern Hospital; Grand View Lodge on Gull Lake, Brainerd, Minnesota. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

21-22 **Treatment of Families in Sexual Crisis Series: Program in Human Sexuality** Research E. Building, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue Southeast, Minneapolis, Minnesota 55414. 612/376-7520.

24-25 **Symposium on Nuclear Medicine** CME, Medical School, University of Minnesota Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

SEPTEMBER, 1986

5-6 **Medical Directors** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium; 420 Delaware Street SE; Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

8-12 **49th Annual Radiology Course:** Gastrointestinal and Abdominal Intervential Radiology; CME, Medical School, University of Minnesota; Willey Hall/AMFAC Hotel; 225 19th Avenue SE; Minneapolis. CONTACT: Office of CME, Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

26-27 **Adolescent Medicine Conference: High Risk Yough** CME, Medical School, University of Minnesota; Earle Brown Center; 1890 Buford; St. Paul. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street, S.E.; Minneapolis, Minnesota 55455. 612/373-8012.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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Family Practice Opportunity at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 N.E. First Street, Faribault, Minnesota 55021. Telephone (507) 334-3921.

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Family practitioner needed to join 2 FP's at the Ellsworth, Wisconsin office of a progressive eleven physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact R. M. Hammer, M.D., River Falls, WI 54022. Phone (715) 425-6701 or (612) 436-8809.

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Geriatrician Bethesda Lutheran Medical Center, (a 298 bed acute care and 138 bed long-term care organization), in conjunction with St. Paul Internists, P.A. is currently seeking a Geriatrician to direct and participate in the development of a Geriatric Medicine program. The ideal candidate will be a Board Certified Physician, licensed in the State of Minnesota, speializing in geriatric medicine. Other qualifications include experience in private practice, geriatric research, and proven experience in general administrative functions, particularly in program development. The major position responsibilities include: directing and participating in the development of a Geriatric Medicine program including research, training, education, long range planning, and policy development; acting as a medical advisor/consultant to the medical staff of Bethesda Lutheran Medical Center; and participating in private practice with St. Paul Internists, P.A. Interested candidates may send their resume and salary/ history expectations in confidence to: Jan Struck, Personnel Director; 559 Capitol Boulevard; St. Paul, Minnesota 55103. (612) 221-2341.

The Department of Psychiatry is offering a one year fellowship in alcohol/ drug dependence for physicians licensed in the United States who have had at least three and preferably four years of training in a primary care field (including psychiatry). Training includes inpatient, outpatient, consultation-liaison, day and evening programs, teaching, administration, and research. Send correspondence including resume and three letters of reference to Joseph Westermeyer, M.D., Director; Alcohol-Drug Treatment Program; University of Minnesota Hospitals; Box 393 Mayo; Minneapolis, Minnesota 55455. The University of Minnesota is an equal opportunity employer and invites and encourages applications from women and minorities.

Family Physician to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon. Liberal vacation and educational allowances. $50,000.00 salary first year with incentive bonus, and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43 bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D.; Blue Earth Medical Center, Ltd.; 520 South Galbraith; Blue Earth, Minnesota 56013. Phone (507) 526-7371. Personal phone: (507) 526-3177. Marjeane Werner, Clinic Administrator. Phone: (507) 526-7371. Personal phone: (507) 854-3682.

Physicians Needed in Arizona. Send CV to Fred Wellhausen; Western Personnel Associates; 316 East Flower; Phoenix, Arizona 85012.

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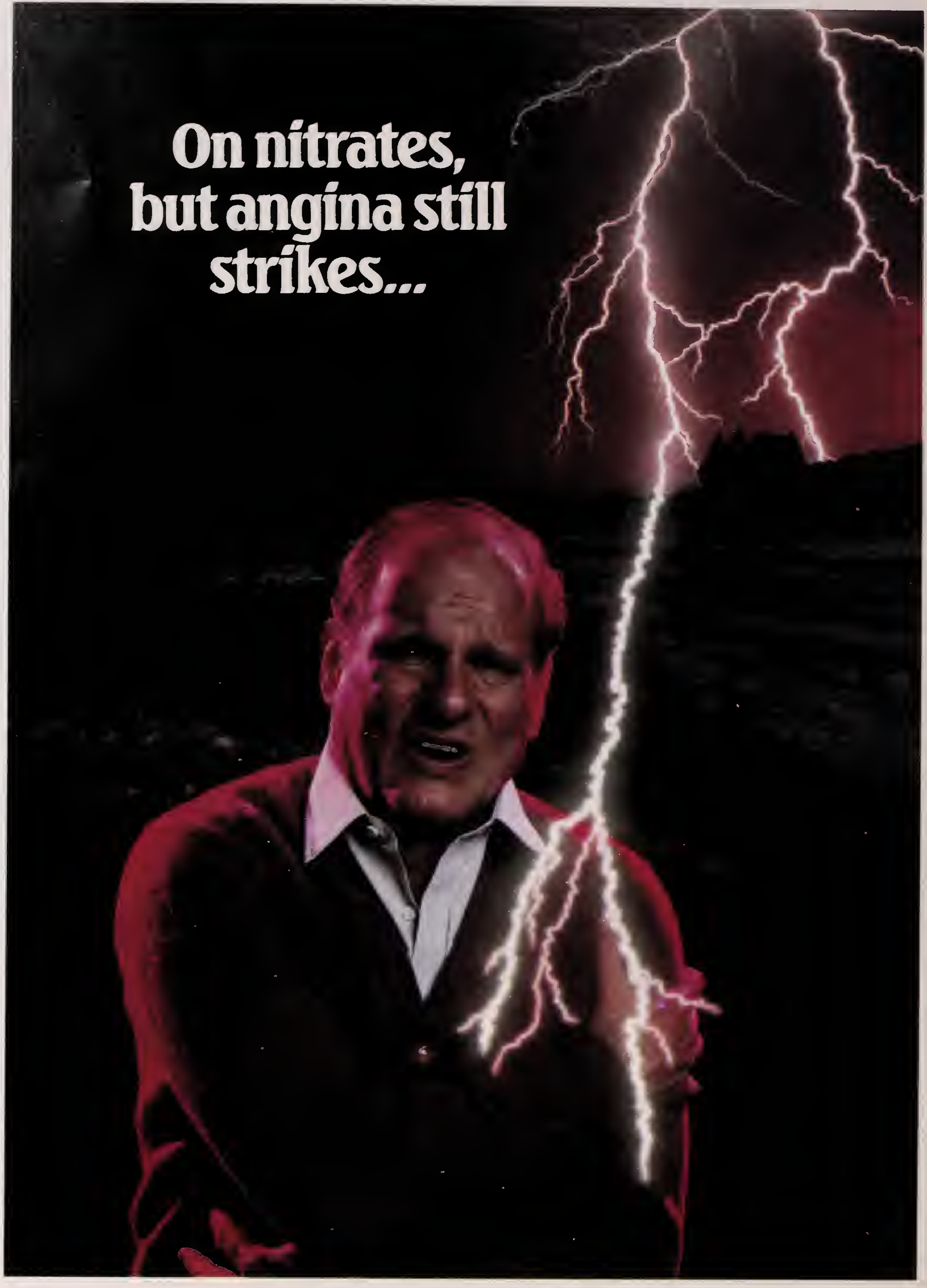
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Cardiovascular contraindications to the use of Isoptin are similar to those of beta blockers: severe left ventricular dysfunction, hypotension (systolic pressure <90 mm Hg) or cardiogenic shock, sick sinus syndrome (if no artificial pacemaker is present) and second- or third-degree AV block.

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ISOPTIN. Added antianginal protection without beta-blocker side effects.

Please see brief summary on following page.

ISOPTIN®

(verapamil HCl/Knoll)

80 mg and 120 mg scored, film-coated tablets

Contraindications: Severe left ventricular dysfunction (see *Warnings*), hypotension (systolic pressure < 90 mm Hg) or cardiogenic shock, sick sinus syndrome (except in patients with a functioning artificial ventricular pacemaker), 2nd- or 3rd-degree AV block. **Warnings:** ISOPTIN should be avoided in patients with severe left ventricular dysfunction (e.g., ejection fraction < 30% or moderate to severe symptoms of cardiac failure) and in patients with any degree of ventricular dysfunction if they are receiving a beta blocker. (See *Precautions.*) Patients with milder ventricular dysfunction should, if possible, be controlled with optimum doses of digitalis and/or diuretics before ISOPTIN is used (Note interactions with digoxin under *Precautions.*) ISOPTIN may occasionally produce hypotension (usually asymptomatic, orthostatic, mild and controlled by decrease in ISOPTIN dose). Elevations of transaminases with and without concomitant elevations in alkaline phosphatase and bilirubin have been reported. Such elevations may disappear even with continued treatment; however, four cases of hepatocellular injury by verapamil have been proven by rechallenge. Periodic monitoring of liver function is prudent during verapamil therapy. Patients with atrial flutter or fibrillation and an accessory AV pathway (e.g. W-P-W or L-G-L syndromes) may develop increased antegrade conduction across the aberrant pathway bypassing the AV node, producing a very rapid ventricular response after receiving ISOPTIN (or digitalis). Treatment is usually D.C.-cardioversion, which has been used safely and effectively after ISOPTIN Because of verapamil's effect on AV conduction and the SA node, 1° AV block and transient bradycardia may occur. High grade block, however, has been infrequently observed. Marked 1° or progressive 2° or 3° AV block requires a dosage reduction or, rarely, discontinuation and institution of appropriate therapy depending upon the clinical situation. Patients with hypertrophic cardiomyopathy (IHSS) received verapamil in doses up to 720 mg/day It must be appreciated that this group of patients had a serious disease with a high mortality rate and that most were refractory or intolerant to propranolol. A variety of serious adverse effects were seen in this group of patients including sinus bradycardia, 2° AV block, sinus arrest, pulmonary edema and/or severe hypotension. Most adverse effects responded well to dose reduction and only rarely was verapamil discontinued. **Precautions:** ISOPTIN should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of excessive pharmacologic effects. Studies in a small number of patients suggest that concomitant use of ISOPTIN and beta blockers may be beneficial in patients with chronic stable angina. Combined therapy can also have adverse effects on cardiac function. Therefore, until further studies are completed, ISOPTIN should be used alone, if possible. If combined therapy is used, close surveillance of vital signs and clinical status should be carried out. Combined therapy with ISOPTIN and propranolol should usually be avoided in patients with AV conduction abnormalities and/or depressed left ventricular function. Chronic ISOPTIN treatment increases serum digoxin levels by 50% to 70% during the first week of therapy, which can result in digitalis toxicity. The digoxin dose should be reduced when ISOPTIN is given, and the patients should be carefully monitored to avoid over- or under-digitalization. ISOPTIN may have an additive effect on lowering blood pressure in patients receiving oral antihypertensive agents. Disopyramide should not be given within 48 hours before or 24 hours after ISOPTIN administration. Until further data are obtained, combined ISOPTIN and quinidine therapy in patients with hypertrophic cardiomyopathy should probably be avoided, since significant hypotension may result. Clinical experience with the concomitant use of ISOPTIN and short- and long-acting nitrates suggest beneficial interaction without undesirable drug interactions. Adequate animal carcinogenicity studies have not been performed. One study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. *Pregnancy Category C:* There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor and delivery only if clearly needed. It is not known whether verapamil is excreted in breast milk; therefore, nursing should be discontinued during ISOPTIN use. **Adverse Reactions:** Hypotension (2.9%), peripheral edema (1.7%), AV block: 3rd degree (0.8%), bradycardia: HR < 50/min (1.1%), CHF or pulmonary edema (0.9%), dizziness (3.6%), headache (1.8%), fatigue (1.1%), constipation (6.3%), nausea (1.6%), elevations of liver enzymes have been reported. (See *Warnings.*) The following reactions, reported in less than 0.5%, occurred under circumstances where a causal relationship is not certain: ecchymosis, bruising, gynecomastia, psychotic symptoms, confusion, paresthesia, insomnia, somnolence, equilibrium disorder, blurred vision, syncope, muscle cramp, shakiness, claudication, hair loss, macules, spotty menstruation. **How Supplied:** ISOPTIN (verapamil HCl) is supplied in round, scored, film-coated tablets containing either 80 mg or 120 mg of verapamil hydrochloride and embossed with "ISOPTIN 80" or "ISOPTIN 120" on one side and with "KNOLL" on the reverse side. Revised August, 1984 2385

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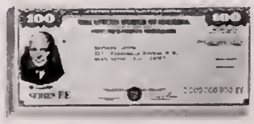

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Central Minnesota Neurosciences a rapidly growing practice, seeks board certified/eligible Neurosurgeon for a growing, congenial community with close access to excellent recreational facilities. Current Neurosurgeon is Canadian trained and board certified. The hospital has a full complement of the most advanced neurodiagnostic and neurosurgical equipment. Contact Christine Morgan, Central Minnesota Neurosciences, 1400 St. Germain, St. Cloud, Minnesota 56301. (612) 259-1405.

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Wanted: Board certified or eligible family physician to join an established clinic of four family physicians. Contact: Gretchen D. Ehresmann, M.D.; 710 S. Division, Northfield, Minnesota 55057. Phone: (507) 645-5646 or (612) 375-0311.

Orthopedic Surgeon Wanted: Board eligible/certified Surgeon interested in tremendous career opportunity, serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics, seek an individual interested in establishing an orthopedic surgery practice in Fairmont, Minnesota. The hospital is well equipped, with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department and well-equipped surgery department. Fairmont is unique, with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator; Fairmont Community Hospital; 835 Johnson Street, Fairmont, Minnesota 56031.

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Family Physician - Four man Family Practice group needs to replace two leaving partners. Board eligible or certified desired. One year salary with partnership thereafter. Would also consider longterm locum tenens. Small town in Central Minnesota Lakes area. Unopposed Family Practice Clinic, 150 bed Regional Hospital at Brainerd, 100 bed Nursing Home, rotate calls. Call or write C. R. Pelzl, M.D., Pine River Medical Clinic, Pine River, MN 56474. (218) 587-4416.

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Wanted: Family practitioner, OB/GYN. Group practice. Central Minnesota. Starting salary $45,000. Write Minnesota Medicine (755), 2221 University Ave. S.E., #400, Minneapolis, MN 55414.

Family Physician and Internist needed for growing southern Minnesota clinic. Associate, solo or locum tenens position available. Will adjust to accommodate. St. James Area Family Clinic, Box 471, St. James, 56081. (507) 375-3391.

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Family Physician Faculty Position Tired of high prices and crowds of people. Escape to Wisconsin! Family Practice Residency Program in Eau Claire affiliated with University of Wisconsin Department of Family Medicine and Practice seeks an additional Family Physician to round out its faculty contingent. For information contact: Eugene Farley, M.D., M.P.H., Chairman, Department of Family Medicine and Practice; 777 South Mills Street; Madison, Wisconsin 53715. (608) 263-3115, or John R. Kludt, M.D., Program Director, Eau Claire Family Practice Residency Program; 807 South Farwell Street; Eau Claire, Wisconsin 54701. (715) 839-5175.

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Internist or Family Practitioner Position available with established medical group in community of 6,000. Excellent facility with 49 bed JCAH hospital adjacent. Southeastern South Dakota college community offers excellent professional and recreational opportunity. Contact: Administrator; Madison Clinic, Ltd.; 903 North Washington; Madison, South Dakota 57042. (605) 256-4564.

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Physiatrist A Medical Director is needed for our Rehabilitation Unit who is an American trained, Board Certified/Eligible Physiatrist. St. Cloud Hospital is a private Catholic non-profit 489 bed facility in central Minnesota, 70 miles northwest of Minneapolis/St. Paul, with a 150 member multispecialty medical staff. St. Cloud Hospital is a Level II trauma and emergency facility. The Rehabilitation Unit has a large (200,000 population) referral area. The present rehabilitation unit is DGR exampt, modern, fully equipped, staffed with 40 professionals (including P.T., O.T., speech pathologist, T.R.) with an outstanding 16 year history and is actively supported by the Medical Staff. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D.; Director of Medical Affairs; St. Cloud Hospital; 1406 North Sixth Avenue; St. Cloud, Minnesota 56301. (612) 255-5626.

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Urgent Care Primary care physicians wanted for full time urgent care in large multi-specialty clinic. Competitive salary, excellent fringes, very good geographic location. If interested, please send letter and C.V. to Donna Anderson, Park Nicollet Medical Center; 5000 W. 39th Street; Minneapolis, Minnesota 55416.

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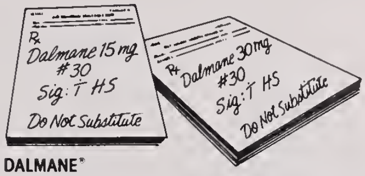
References: **1.** Kales J, *et al: Clin Pharmacol Ther 12*:691-697, Jul-Aug 1971. **2.** Kales A, *et al: Clin Pharmacol Ther 18*:356-363, Sep 1975. **3.** Kales A, *et al: Clin Pharmacol Ther 19*:576-583, May 1976. **4.** Kales A, *et al: Clin Pharmacol Ther 32*:781-788, Dec 1982. **5.** Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc 27*:541-546, Dec 1979. **6.** Dement WC, *et al: Behav Med*, pp. 25-31, Oct 1978. **7.** Kales A, Kales JD: *J Clin Psychopharmacol 3*:140-150, Apr 1983. **8.** Tennant FS, *et al:* Symposium on the Treatment of Sleep Disorders, Teleconference, Oct 16, 1984. **9.** Greenblatt DJ, Allen MD, Shader RI: *Clin Pharmacol Ther 21*:355-361, Mar 1977.



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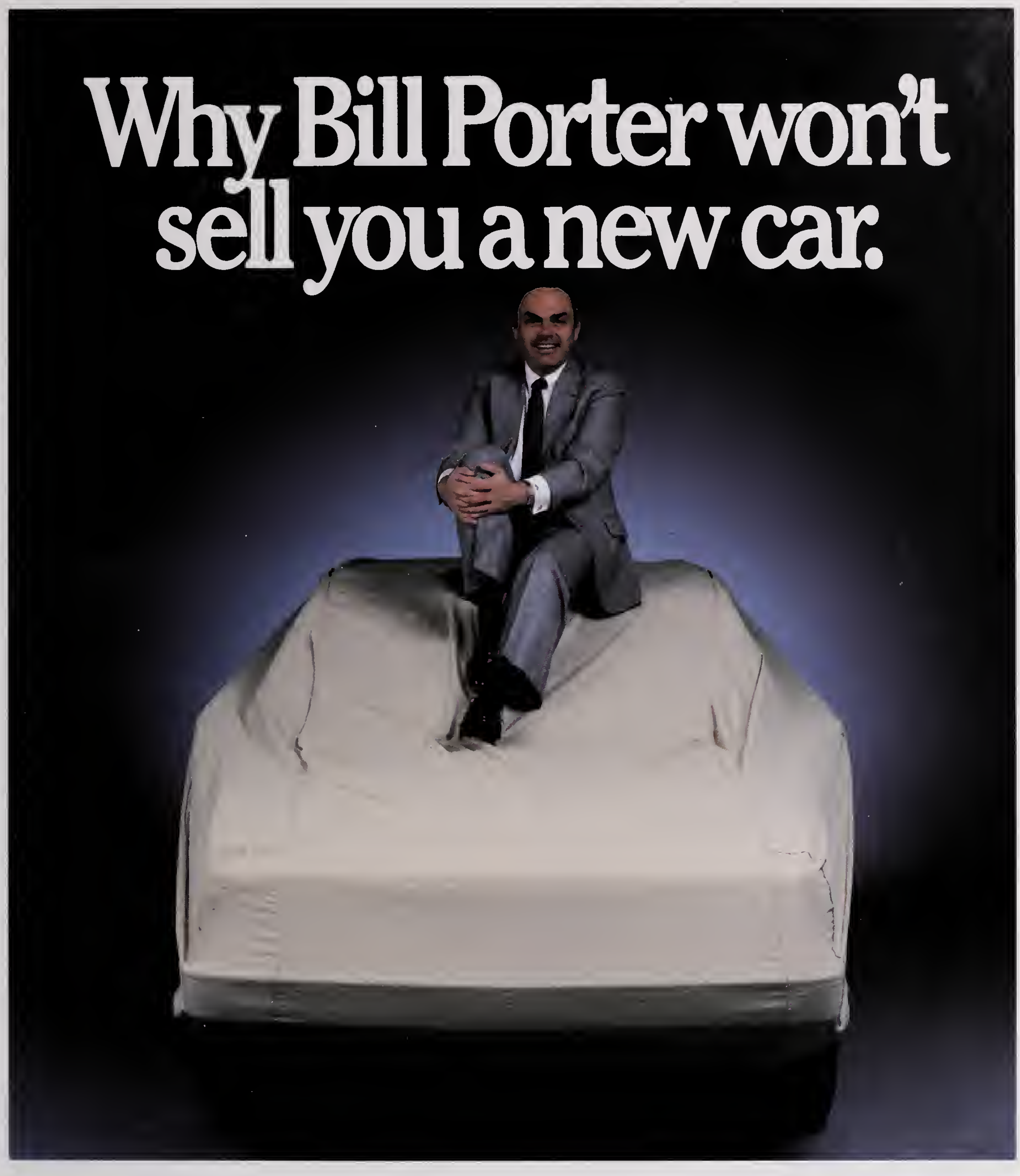
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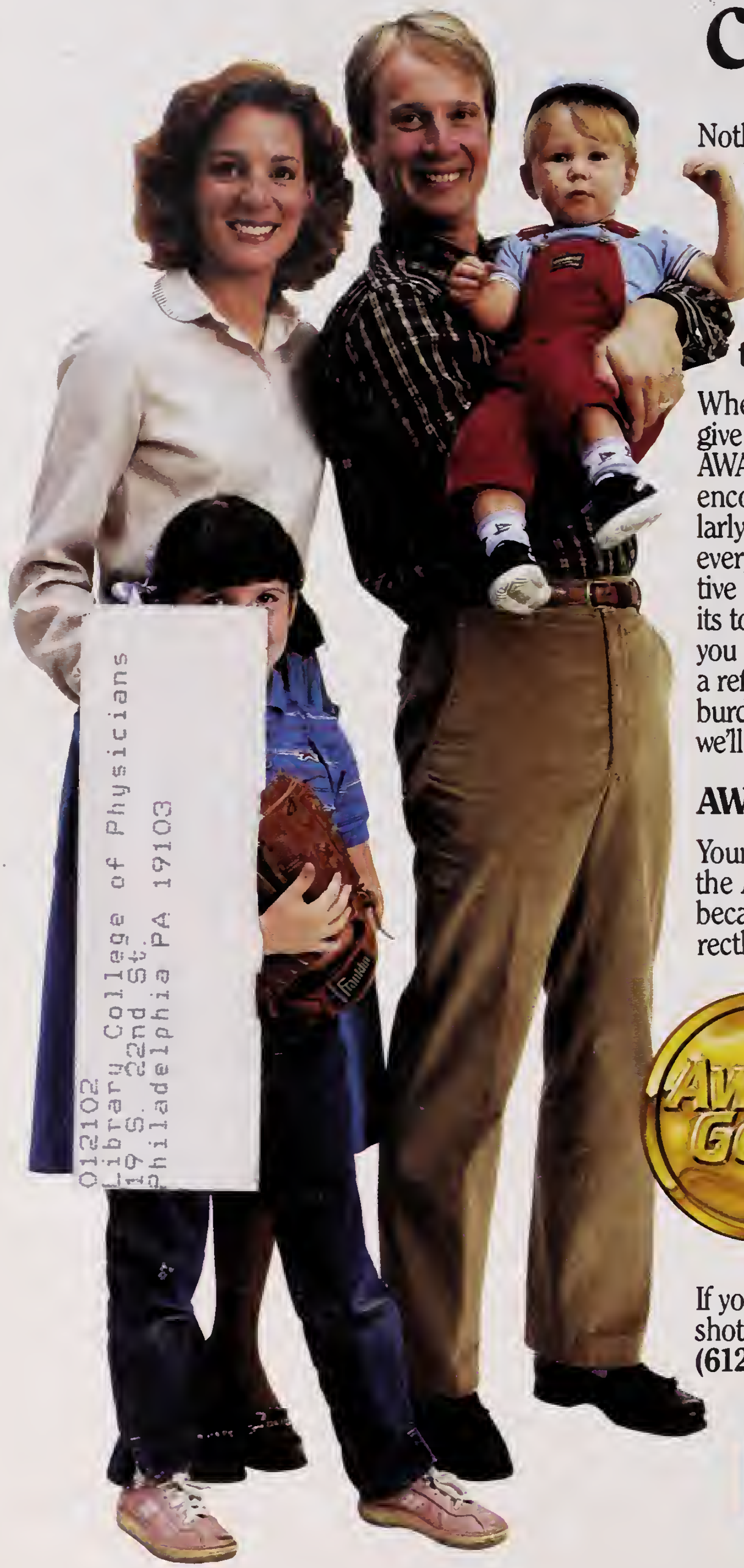

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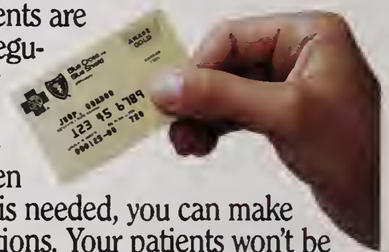

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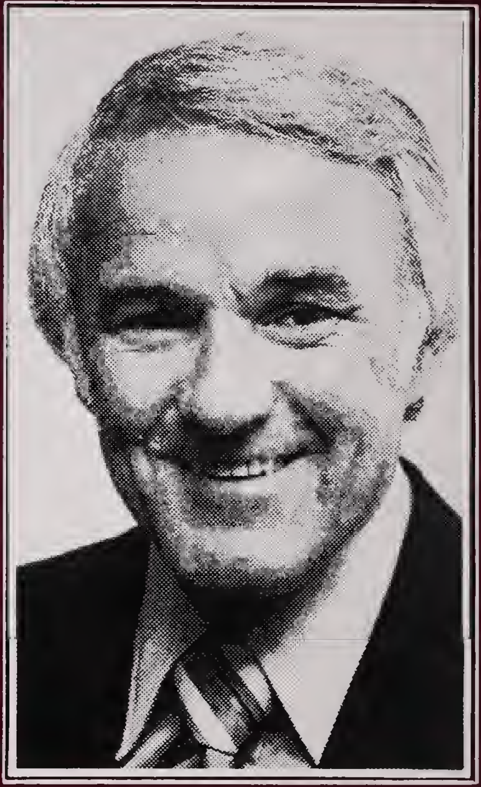

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President's Letter

Reflections of an Outgoing President

Peggy Craig

M. Elizabeth Craig, M.D.
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Not long ago, I was describing to a friend the emotions of leaving office. It's similar to seeing a child go off to college: you're eagerly anticipating the change in lifestyle, yet saddened to say goodbye.

The year has been productive and I have been gratified by the involvement and cooperation of so many of my colleagues.

The list of MMA's accomplishments is impressive, topped by our successful tort reform professional liability initiative. None of us anticipated that so much could be accomplished in just one year. Success was due to personal involvement and heroic efforts on the part of physicians as well as the efforts of our dedicated staff.

Another success which is important is the heightened positive visibility we have attained with the general public, our patients. We first had to recognize that such visibility was necessary in today's world if we were to counter the negative influences affecting our profession. Through our Public Education Program (PEP), the MMA has increased its communication with representatives of the media, community opinion leaders and the public in general. We continue to be received well, due in large part to our increased focus on public health initiatives. These efforts—and the involvement of physicians—must continue and grow for the protection of the medical profession and our patients.

A small portion of Minnesota's physicians are still unable to understand the critical importance of organized medicine. **I am both saddened and frustrated that these physicians are neither contributing to the future of medicine or recognizing the benefits they are receiving because of the efforts of others. In other words, these colleagues are freeloading.**

At the same time, it has indeed been a pleasure to meet and work with so many physicians who have exhibited a high degree of involvement, dedication and loyalty to organized medicine.

The 12 busy months of serving as MMA president now lead me into a change of lifestyle which I eagerly anticipate. Yet, I am saddened to relinquish the presidential duties from which I have received great enjoyment and understanding.

While it has always been a high priority, the depth and breadth of my understanding regarding the physician's primary role has grown as I've met with so many people inside and outside the profession.

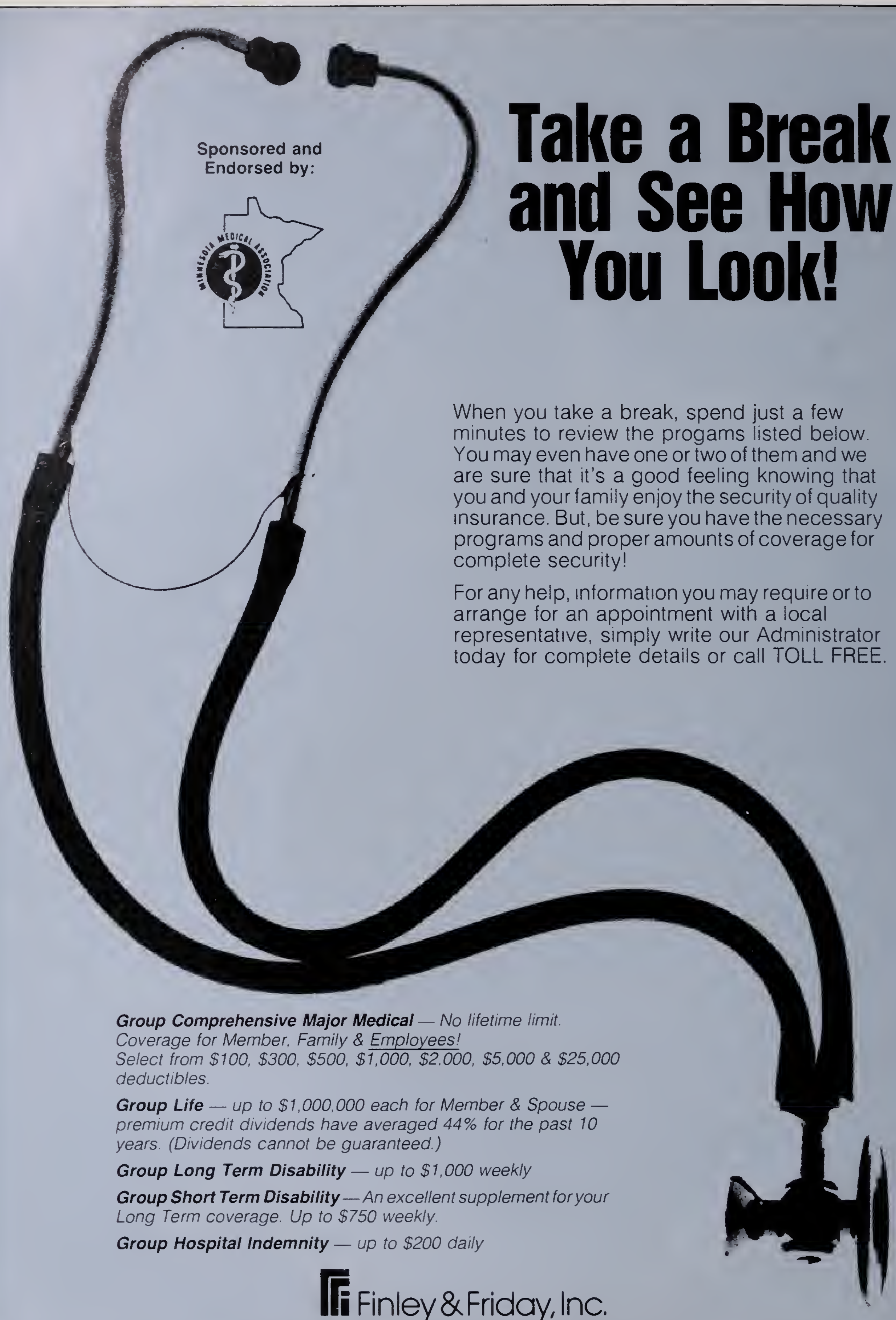
We are the patient's advocate. And each physician *must* recognize this important role and acknowledge the trust—the almost sacred relationship—that each physician holds with his or her patients.

Regardless of how the system changes—or from where we derive our incomes—this is the physicians' challenge: **to preserve the special relationship between patient and physician despite the rapidly evolving medical industry and the changes and demands it brings.**

The MMA is dedicated to helping physicians meet this challenge.

I feel a great urgency that this be my message to you.

I leave this office in the capable hands of Dr. James Knapp. Thank you for the special opportunity of serving as your president for the past year. I have gained far more than I have given.



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Editor's Notebook

King for a Day: Or, Dreams of Being Old*

This week, for the first time, this nation celebrated Martin Luther King's birthday. What does King's birthday have to do with the future of Geriatric Medicine? Well, the old and the blacks of America share certain traits.

Both make up about 11 percent of the United States' population. Both are exploding in numbers. And both often regard themselves as neglected stepchildren or victims of a conservative revolution in this country.

I don't have to remind you differences exist between the two. The old vote more. The old have significantly more political power. And let us not kid ourselves. The old are more affluent. In America, people over 50 comprise 25 percent of the population, have 50 percent of the discretionary income and own 77 percent of the assets. And yet the old, particularly the "old-old" over 85, are more vulnerable too.

But let's not linger over the differences. Permit me, if you will, to be King for a day.

Dreams

I have a dream.

I have a dream my wife and I will live to be old together.

I have a dream she and I will lead full, well-rounded, and productive lives as old people.

I have a dream we will maintain our relationships with our families and our immediate friends.

I have a dream we will know exactly who we are as individuals because of a long life of self-knowledge, and, as in the case of President Reagan, we will be secure with ourselves and with others.

I have a dream we will welcome and accept change and we will seek the opportunities that bring change.

I have a dream that before we become old we will identify mentors that we admire among the old and that we will replicate their habits and practices when we reach their age.

I have a dream we will constantly search out a diversity of young friends; we will walk hand in hand with them; and we will enrich their lives and their's ours.

I have a dream we will contribute the fruits of our knowledge and experience to society and society will invite those contributions.

---

*Talk before the American College of Nursing Home Administrators and Minnesota Gerontological Society, Hotel Sofitel, Bloomington, Minnesota, January 23, 1986.

I have a dream we will remain part of the social fabric of our community, our church, our service clubs and our business and social circles.

I have a dream we will recognize the inevitable decline into frailty and will set aside funds for handling that frailty.

I have a dream the government will provide ourselves and our children with tax incentives for saving for long-term care.

I have a dream the third party payers and the medical establishment will recognize geriatrics as an important medical specialty, gerontology as a discipline and nursing homes as equivalent in importance to acute care hospitals for the care of the elderly.

I have a dream the government will permit private industry and voluntary hospitals to have the flexibility to initiate innovations - such as social HMOs, geriatric day care centers and institutes for the treatment of Alzheimer's Disease - that will give multiple humane options to the elderly.

I have a dream American medicine will respect dignity - what most elderly would appreciate most is doing away with hospital gowns, knocking before entering the hospital room and a printed explanation of the procedure they are about to undergo.

I have a dream we doctors will give common-sensical advice - that generic aspirin is as good an antiarthritic drug as any, that you should look first to drugs as a source of elderly confusion and that a high fiber diet is better than any laxative.

I have a dream the government and medicine will encourage the establishing of geriatric training programs that produce specialists who know just the right mix of medicine, psychiatry, social work and pharmacology. They need look no further than the excellent program for internal medicine at Hennepin County Medical Center. This program embraces 69 resident physicians, more than 1,000 patients and 29 private community nursing homes.

I have a dream American medicine will exercise good sense in recognizing its role to provide technologies - hip arthroplasties, coronary bypasses, pacemakers and lens implants - to restore the quality of life to otherwise unimpaired "young-old" and to show compassion, understanding and assistance to the "old-old."

My Task

So much for my dreams. You have invited me here to speak on the future of geriatric medicine. I do not know the future. But I do know the present. Today, out of 500,000 American physicians, only 700 are trained in geriatrics. Yet 28 million Americans are over 65, by 2000, one in five of our citizens will be over 65 and over 100,000 will be over a 100 and by 2050, one out of eight Americans will be over 75. Today, over 40 percent of Medicaid funds go to support 1.5 million nursing home beds and God knows how many dollars will be needed by 2050 when 5 million nursing home beds will be in use.

Low Esteem for Geriatric Medicine

To change the current low esteem of most physicians for geriatric medicine (geriatrics is one of the five specialties in American medicine with a shortage of physicians - child psychiatry, physical medicine and rehabilitation, emergency medicine, preventive medicine and general psychiatry being the others), we need to make changes. What we presently need are geriatric fellowships to prepare people to teach geriatrics in our medical schools. Some 200 of these fellowships now exist in the Veteran's Administration System. We also need to make geriatric rotations in nursing homes a routine practice for internal medicine residents, family practice residents and medical students. We need, in short, to focus on the old.

How to Clear a Room of Health Planners

When you asked me to speak on the future of geriatric care and by extension on long term care, you did not give me an enviable task. There's a story circulating around Washington that the quickest way to clear a room of health care planners is to declare: "We are here to discuss the future of long term care."

No Winners

If you are a congressman, you cannot win in such a discussion. The young, who see up to 43 percent of their income going to social security and who read that 50 percent of the federal budget will go to support the old by 2050 if present trends continue, are threatening to revolt against carrying too much of a burden for the old.

By 2030, the ratio of workers to beneficiaries will go from the current 3.1/1 to 2/1. The middle aged and middle class, who must bear the burden of any general government program, are in no mood to finance long term care when they have not yet brought to bay those financial monsters known as Medicare and Medicaid; who, even as we speak, are roaming through the country pillaging, foraging and consuming personal wallets and public budgets. And the old and their families, who are already paying more than half of nursing care out-of-pocket and who see the old reduced to poverty to qualify for Medicaid, are furious at any sign of neglect of the elderly.

Something Must Be Done for Elderly

Yet something must be done. Those over 75, especially those over 85, are exploding in numbers, and at least 25 percent of those over 85 will require long term care. This demographic timebomb was brought home to me when I read Americans will have over 100,000 people over 100 by the year 2000. As a society, we can manage the "young-old," those from 65 to 74, by delaying retirement to 70, by moving back social security benefits to 68, to "unretiring" productive older citizens by returning them to temporary or even permanent work, and by simply recognizing them as an essential part of the fabric of American society.

Managing the "Old-Old"

But the "old-old," those over 75, cannot be managed so simply. They often have no other recourses because of their frail conditions. Ninety percent of elderly people going into nursing homes run the risk of being impoverished in two years. They must "spend down" - deplete their assets - to qualify for Medicaid.

Restructuring Medicare

We must somehow restructure Medicare to provide for the chronic needs of the elderly, market special insurance policies for long term care, as Prudential is now doing in concert with the AARP and carry through demonstration projects like Social Health Maintenance Organizations - which provide comprehensive acute care, nursing home care, home health care and social services - to see if they work. Finally, I think the government ought to offer either medical IRA-accounts for long term care, or a comprehensive policy such as the National Health Care Trust Plan suggested by Anylan and Lipscomb[1], to give Americans the tax incentives to care for themselves in the end stages of their lives.

Role of American Association of Retired Persons

There are signs of hope. The process of educating the public about the unpleasant alternatives in caring for the old is underway. And here I must give credit to the American Association of Retired Persons, which has become a formidable political and educational force in educating America about the plight of the elderly. Not only do they publish the AARP Bulletin which goes to their millions of members, but they send MODERN MATURITY, a magazine with 8.3 million subscribers (as such, it ranks fourth after READERS DIGEST, T.V. GUIDE, and NATIONAL GEOGRAPHIC) to anybody who plunks down $5 to join AARP.

AARP is also engaged with Prudential Insurance Company in test marketing by direct mail to 25,000 customers a special nursing home package for the elderly. A monthly premium of between $75 and $95 will cover three years in a nursing home at $40 a day or 365 visits by a home health-care nurse at $25 a visit or someone to help with meals and housekeeping at $20 a day. Anyone up to 80 is eligible to apply. Finally, AARP is leading the charge in a recent hearing in the House of Representatives by Claude Pepper and the hearing on the Special Committee on Aging, chaired by Senator John Heinz.

Messages from the Media

The media is also making education contributions. I refer here to Hugh Downs' December 28 ABC television program on "Growing Old in America" with its plea to "re-integrate older Americans back into the mainstream;" its poignant stories of the "dumping" going on under DRGs; and it stresses that 2/3 of the "old-old" will die as paupers, "institutionalized and bankrupted."

I would also like to bring to your attention an excellent article in the December 15 Sunday NEW YORK TIMES magazine entitled "New Focus on the Old," which puts the education of geriatricians in its proper perspective. And finally, a nod to the newspapers of America - the Minneapolis Star and Tribune, the Los Angeles Times, and the New York Times - who have published a series of thoughtful articles on nursing homes, suicides among the elderly, the increasing longevity, growing old at home, and on the work of Traveler's Insurance Company in "unretiring" 11,000 of its former employees. And another kudo to the Minnesota Gerontological Society, which published its first issue of the Minnesota Journal of Gerontology in the Winter of 1985 under the editorship of Katherine Gray, who is head of geriatric programs at the Metropolitan Medical Center in Minneapolis.

Mentors of Mine

I would like to close with stories of three elderly mentors of mine. By their examples, they have taught my wife and I how we might live when we reach their ages.

- M.K. is 77, a Jewish widow, and a European immigrant. She was once well-to-do, but twice lost her fortune, first to the Nazis and then to the Russians in 1956. Hers is a triumph of attitude. She cultivates friends only among the young. Otherwise, she says, she could lose all her friends in one spring. She exercises each morning in bed, with leg lifts. She does not jog, but she "marches" around the block and along the beach.

  She never turns down social invitations from those younger than she. She travels incessantly. She is constantly thinking of her friends - sending them cards, celebrating their anniversaries, inviting them in for sherry and showering them with wonderful torts and other Viennese delicacies.

  She participates once a week in an art group; volunteers one day a week at Courage Center; attends the symphony and the Guthrie; lives independently with another older woman not too far from her son; although she lives independently, she is always available to serve as a model grandmother and close confidant; she has had a hip replacement but is otherwise well. In her conversations with her young friends, of which I am privileged to be one, she dwells on opportunities rather than problems, on the future rather than the past; on new ideas and trends rather than on gossip and stale news of gloom and doom. She is a vital woman, and my wife and I never think of her age when we are with her.
- L.M. was a Czech farmer, who we first knew at 75 and who died at 87. His secret to longevity and happiness, he said, was to keep moving, to do useful work and to pace himself. He performed manual labor and upkeep for us at our farm for

12 years. He sang when he worked. He took full advantage of every mechanical advantage he could think of. He took pride in his versatility and was amazed at the mechanical ineptitude of his doctor employer. He took time to talk, to explore the ins and outs and nuances of every conversation; he was sensitive to the abrupt end of any conversation. "You've always got time to talk to me," he would say.

And, above all, he celebrated - birthdays, holidays, funerals, weddings, the felling of a dead elm, the planting of a crop, our arrivals and departures from the city, every day of his 62 years of marriage with his wife, his newly found vision after a cataract operation, card games and barn dances. He touched and hugged and kissed and flirted with women of all ages. He had a passion for compassion. He may have been wrinkled, but he always twinkled.

- And, finally, there are Doctor and Mrs. T., now 81 and 77. Both are well-educated and graduates of prestigious colleges. Theirs are lives of the minds, the bodies, and thoughtful lifestyles. They read all the current books and talk animatedly about them. They enjoy at least one "juicy" or racey book a month, just to keep the mind alive and the animal juices flowing.

They walk one hour a day, do exercises at their health club once a week, play golf and swim together. And they continue to contribute to society - by attending hospital meetings, by working in civic groups, by keeping abreast of current professional advances in their respective fields.

They do not hesitate to invest in new projects. Just this year, they completely renovated their kitchen. They visit their daughters each year and stay in close touch with their grandchildren. And both are social creatures that like nothing better than mixing with younger people.

All of these people are serene. They know who they are, have firm philosophies, act outwardly rather than moping inwardly, remain active participants in their community, have a healthy respect for sex and celebrate the gift and joy of life each day.

I close with two pieces of advice, one from Satchell Paige, who pitched in the major leagues until he was 65, and the other from myself, in a 1977 editorial in Minnesota Medicine called, appropriately, "The Long Life in Minnesota."

Satchell said the following rules "are mighty good for anybody who wants to live a lengthy and happy life":

> "Avoid fried foods which angry up the blood.
>
> If your stomach disputes you, lie down and pacify it with cool thoughts.
>
> Keep the juices flowing by janglin' around gently as you move.
>
> Go very light on the vices, such as carrying on in society - the social ramble ain't restful.
>
> Avoid running at all times.
>
> And don't look back. Someone might be gaining on you."

And I said:

> "To live to be one hundred: Pick your parents, stay lean, keep moving, stop smoking, drink lightly, remain calm, chase girls (or boys), sleep well, ignore your enemies, climb mountains, don't retire, and if Ecuador, Kashmire, Soviet Georgia, Northern Europe, or Hawaii aren't your cups of tea, live in Minnesota."

To this I would add:

> "Put aside a cent or two each day to live like a Centurian should."

I end by saying the body may grow old, but the mind, the spirit and the creative fires need never grow old. In the January 22nd NEW YORK TIMES appeared this composite portrait of 12 artists, aged 70-91:

> "In them all burns a creative flame that only death or mental incapacity can extinguish. That sets them apart. So, too, does the unending challenge of the empty canvas, the blank page, the unfilled space - and the nagging fear that one morning, they might be unable to meet that challenge. When creativity ends, they all say, life ends also. It is their work - the demands of it, the daily discipline and the dissatisfactions - that fuels them all and is central to their lives."

Keep something central to your lives, something that demands discipline and creates dissatisfaction.

And remember this piece of advice from Jack London:

> "Man's chief purpose is to live, not to exist. I shall not waste my time trying to prolong them. I shall use my time."

Use your time to the fullest, ladies and gentlemen. It is limited.

Richard L Reece MD

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1. Anylan WG; and Lipscomb J: The National Health Care Trust Plan: A Blueprint for Market and Long-Term Care Reform. Health Affairs 4:5-31, 1985.

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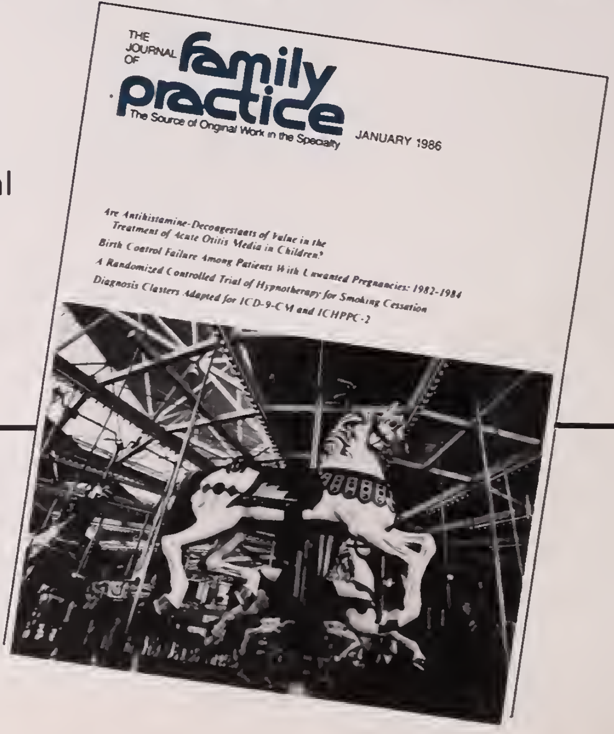

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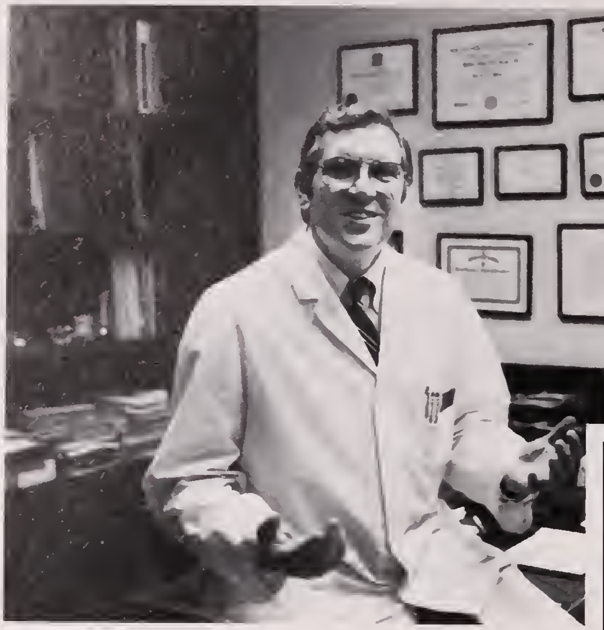

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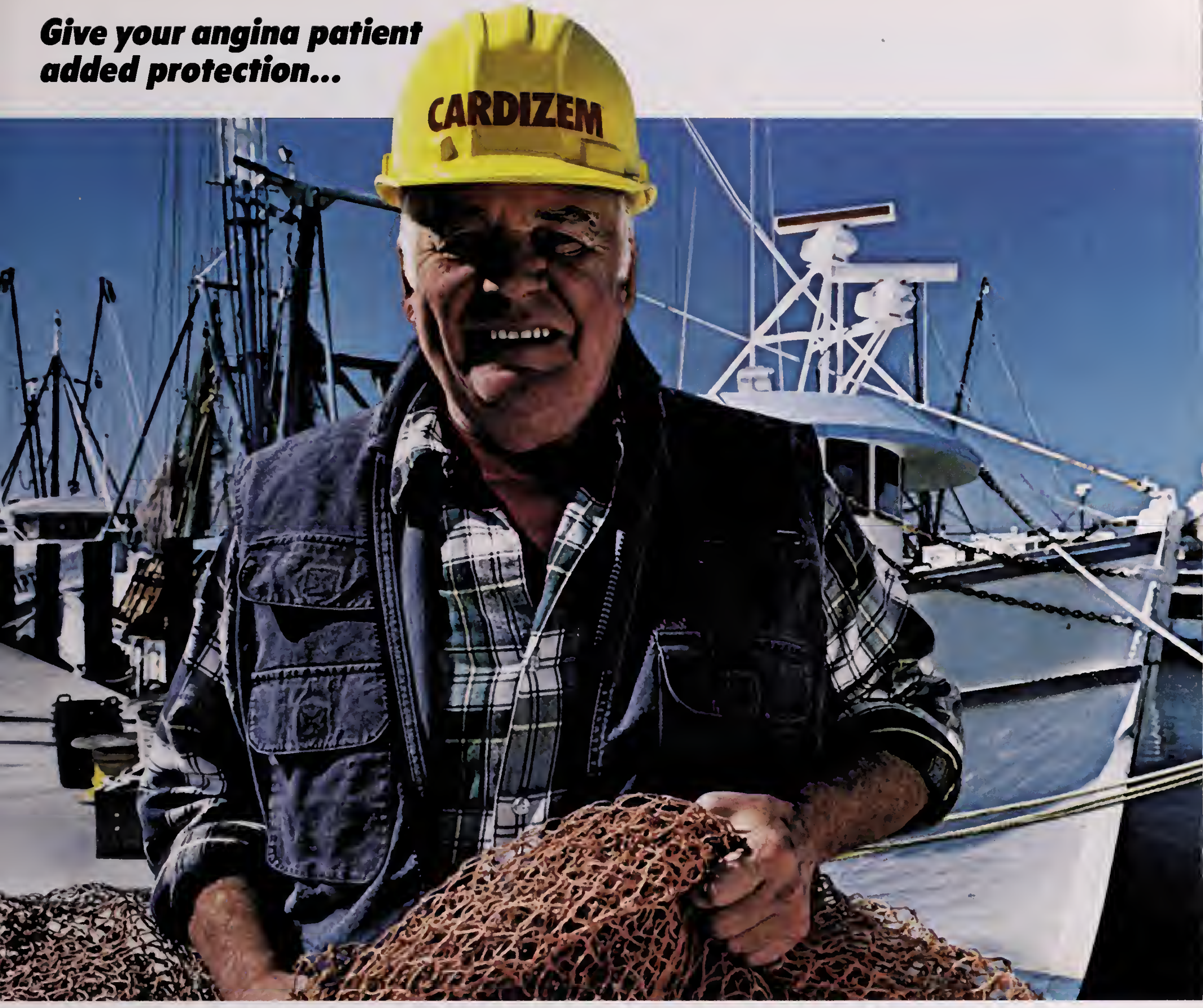

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FEWER SIDE EFFECTS IN ANTIANGINAL THERAPY

BRIEF SUMMARY

CARDIZEM™ (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist).

INDICATIONS AND USAGE

1. **Angina Pectoris Due to Coronary Artery Spasm**. CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm. CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks).
2. **Chronic Stable Angina (Classic Effort-Associated Angina)**. CARDIZEM is indicated in the management of chronic stable angina. CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance.

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities.

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction**. CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure**. Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited. Caution should be exercised when using the drug in such patients
3. **Hypotension**. Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.
4. **Acute Hepatic Injury**. In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women, therefore, use CARDIZEM (diltiazem hydrochloride) in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation.

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%), AV block (1.1%). In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence.

Cardiovascular:	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope
Nervous System	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia
Gastrointestinal	Constipation, dyspepsia, diarrhea, vomiting, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH
Dermatologic.	Pruritus, petechiae, urticaria, photosensitivity
Other.	Polyuria, nocturia

The following additional experiences have been noted

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: erythema multiforme; leukopenia, and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited. Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers. In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage. The following measures may be considered

Bradycardia	Administer atropine (0.60 to 1.0 mg). If there is no response to vagal blockade, administer isoproterenol cautiously
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg, dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral LD_{50}'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively. The intravenous LD_{50}'s in these species were 60 and 38 mg/kg, respectively The oral LD_{50} in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg. The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity

DOSAGE AND ADMINISTRATION

Exertional Angina Pectoris Due to Atherosclerotic Coronary Artery Disease or Angina Pectoris at Rest Due to Coronary Artery Spasm. Dosage must be adjusted to each patient's needs. Starting with 30 mg four times daily, before meals and at bedtime, dosage should be increased gradually (given in divided doses three or four times daily) at one- to two-day intervals until optimum response is obtained Although individual patients may respond to any dosage level, the average optimum dosage range appears to be 180 to 240 mg/day There are no available data concerning dosage requirements in patients with impaired renal or hepatic function. If the drug must be used in such patients, titration should be carried out with particular caution.

Concomitant Use With Other Antianginal Agents:

1. **Sublingual NTG** may be taken as required to abort acute anginal attacks during CARDIZEM therapy
2. **Prophylactic Nitrate Therapy** — CARDIZEM may be safely coadministered with short- and long-acting nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.
3. **Beta-blockers**. (See WARNINGS and PRECAUTIONS.)

HOW SUPPLIED

CARDIZEM 30-mg tablets are supplied in bottles of 100 (NDC 0088-1771-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1771-49). Each green tablet is engraved with MARION on one side and 1771 engraved on the other. CARDIZEM 60-mg scored tablets are supplied in bottles of 100 (NDC 0088-1772-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1772-49). Each yellow tablet is engraved with MARION on one side and 1772 on the other Issued 4/1/84

See complete Professional Use Information before prescribing.

D642T5

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Guillain-Barre Syndrome - 1985

A Review With Personal Insights

JAMES R. ALLEN, M.D.*

The author describes his personal encounter with Guillain-Barre Syndrome and reviews the topic. This inflammatory polyradiculoneuropathy may have a number of different etiologies, but essentially appears to be an auto-immune process. The most striking symptoms are those of muscle weakness but respiratory and autonomic problems account for a five percent mortality. No specific treatment is available as yet but plasmapheresis offers hope of arresting the auto-immune process in some cases.

Timely diagnosis and adequate treatment are essential in Guillain-Barre Syndrome (GBS) to reduce the mortality as well as the severity of symptoms and prolonged course which result from nerve root demyelination. Having experienced this syndrome firsthand, I thought perhaps the combined perspective of a neurologist-patient might be useful to other physicians in recognizing GBS and determining an appropriate treatment plan.

Case Report

As a 48-year-old physician in excellent medical health, it was my habit to run about two miles and carry out 20 push-ups, sit-ups, leg raises and other exercises daily. In early September 1984, following a particularly hectic Labor Day weekend on call, I began noticing aching of both thighs along with fatigability. About two to three weeks before this, there had been a bout of severe headaches and sore throat which had rapidly cleared without any apparent residuals. I consulted my personal physician on two occasions and had a complete physical examination as well as extensive laboratory work, all of which proved to be within normal limits. This included testing the various muscles for single maximal contractions. However, it was primarily with repetitive activity such as walking, stair climbing and exercising that the muscle fatigue and weakness occurred. There was no evidence of an acute febrile illness, neoplasm, metabolic abnormality, polymyositis or collagen disease. The diagnosis of Guillain-Barre Syndrome was entertained, but there was not sufficient evidence to make the diagnosis at that point in time.

Stair climbing became increasingly difficult with heavy reliance on the hand rail. Negotiating the long hallways and tunnels at the hospital also became a formidable task. My wife and I had planned a trip to the Montreal Neurological Institute and had decided, unwisely as it turned out, to proceed with that plan. We drove our Suburban truck, and stayed at campgrounds along Lake Superior and Lake Michigan. The fall color was beautiful but my lack of ability to hike even short distances resulted in more of a trial than an adventure.

Montreal (unfortunately, named after Mount Royale) is a beautiful, charming, historic old city but with very steep streets as well as steep stone staircases inside and outside of buildings. By now, I could only walk about one block at a time, very slowly, and then would need to sit on a window ledge or lean against something to keep from falling while the muscles recuperated enough to continue another short distance. I attended the first two days of meetings but realized my condition was much worse and consulted the neuromuscular specialist at the Montreal Neurological Institute who confirmed the diagnosis of GBS and advised me to fly home immediately. As the flights to Minneapolis involved going through Detroit and Chicago, it appeared that a better alternative might be a rapid trip home on the road.

We therefore arose at 5:00 a.m. and made our way out of Montreal through the fog and rain. It is a 1200 mile drive with Sault Ste. Marie at the halfway point. We had planned to stay overnight there but all of the motels were full of fall color enthusiasts. About 100 miles out onto the Upper Peninsula of Michigan, we found a small motel off the main road and were able to rent the last room after prying the proprietor out of the local tavern. There was no heat in the room and it was 26 degrees Fahrenheit outside with snow on the ground. By this time, I could scarcely walk and was unable to squeeze the toothpaste out of the tube. The walls were paper-thin in the motel and the young couple next door had better things to do than sleep. Therefore, at 4:00 a.m. we loaded up and set off for the Twin Cities again. I tried to spell my wife at the wheel but went through a stop sign because I was unable to move my right leg to apply the brake. After that, she did all the driving. About every one to two hours, another muscle group would become paralyzed, particularly in the lower extremities. In addition, there were brief, sharp, stinging pains in the extremities, as though one were receiving an injection of Penicillin or tetanus toxoid into the palm of the hand or sole of the foot. This would ache for a few minutes afterward and then disappear. There were other vague sensory symptoms but the muscle weakness and fatigability predominated.

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After arriving home I entered the hospital. Over the next 24 hours, the proximal lower extremities became totally paralyzed for all directions of movement and the right arm could not be held up. The left side of the face became weak and the vital capacity dropped from 110 percent to 80 percent. Other autonomic symptoms appeared including coldness of the extremities, diaphoresis, and heaviness of the chest with a right bundle brach block on the EKG. At this point, we decided to proceed with plasmapheresis and three of these were carried out over a four day period. 14,000 cc of plasma were removed and replaced with five percent albumin. The progression of the symptoms stopped after the first treatment and very slow improvement began to take place. I went into shock while trying to sit up during one of the plasma exchanges, with a marked drop in blood pressure, blurred vision, slurred speech, nausea, etc., but this rapidly cleared. The only other problem associated with plasmapheresis came about on two occasions when calcium was being given to replace the amount lost during the procedure. A slow infusion had been prescribed but inadvertently this was flushed in rapidly, producing a pronounced sensation of heat for several minutes in the trunk and perineal area. However, the results of plasmapheresis were well worth the inconvenience.

In the hospital, it was difficult to sit up in bed for even a few minutes at first without experiencing autonomic symptoms, but as improvement occurred, I was able to sit in a chair, walk with crutches or two canes for short distances and return home after two weeks.

Just to get over the threshold into the house was a struggle and to carry out routine activities such as taking a shower, brushing my teeth, shaving, dressing, etc., produced such fatigue that I would need to lie in bed for a half hour or so just to summon enough strength to walk to a chair in the family room. The improvement was slow and somewhat erratic, but I was able to return to work after three and one-half months from the onset. The fatigability persisted with certain activities such as prolonged standing, stair climbing, or walking more than 40 or 50 yards. When the condition was at its worst, even my speech and interest in my surroundings would fatigue quickly. Muscle twitches, presumably myokymia, were quite severe for two to three months, but then lessened and eventually cleared. An excellent bit of advice came form a former patient with GBS who called and discussed the similarities between our cases and then suggested, to avoid discouragement, that I plan on improvement about every two weeks rather than looking for it on a day-by-day basis. With that advice and with the joy that comes from the return to good health, I have been able to cope with this very well. I have also developed an even greater appreciation of our health care system and the importance of the support of family, friends and colleagues.

Guillain-Barre Syndrome (GBS) has gradually evolved into a fairly well recognized clinical entity. It has been given a number of names (Table 1) but consists essentially of an inflammatory polyradiculoneuropathy.

TABLE 1

GBS Symptoms

Polyradiculoneuropathy

Acute idiopathic polyneuropathy

Landry's Syndrome

Landry-Guillain-Barre-Strohl Syndrome

In 1859, Landry offered the first description of ascending symmetric paralysis (Table 2) and in 1916, Guillain-Barre and Strohl pointed out the elevated protein and normal cell count in cerebrospinal fluid of most patients. Haymaker and Kernohan described the inflammatory reaction which was maximal in the proximal nerve roots but in peripheral nerves as well.[1] As larger series of patients have been reported, we are now better able to grasp the clinical spectrum of this syndrome and avoid some of the arbitrary exclusions of earlier authors.[2-6]

TABLE 2

History

1859 - Landry - first description - ascending symmetric paralysis with absent tendon reflexes, peripheral sensory deficit, respiratory death.

1916 - Guillain-Barre and Strohl - noted CSF albuminocytologic dissociation.

1949 - Haymaker and Kernohan - pathologic description PNS changes.

There may be some merit in dividing these into primary and secondary cases since approximately two-thirds are preceded by another illness (Table 3), surgery or other condition.[2] The Swine Flu vaccination is perhaps the most recent to be implicated.[7] The syndrome involves males twice as frequently as females, but affects all ages and races. It occurs at a rate of approximately 1.5 cases per 100,000 population. Most persons feel GBS is an auto-immune disease with both cellular hypersensitivity and serum antibodies involved in response to an antigen. These apparently then attack the myelin of the peripheral nervous system. Viral infection is the most common precursor, usually upper respiratory or gastrointestinal, approximately one to four weeks prior to GBS onset.

TABLE 3

Epidemiology

Two-thirds of cases preceded by underlying illness or condition - e.g. viral or bacterial infection, vaccination (e.g. swine flu), allergic and immune states, metabolic or endocrine disturbances, toxic exposures and neoplasms.

All ages, seasons and races

Male: Female 2:1

1.5 cases per 100,000 population

The clinical symptoms (Table 4) usually begin in the lower extremities with paresthesias or weakness. Myalgia of the back or other muscles occurs in about one-third and headaches in one-fifth of all cases. Cranial nerve involvement is seen in approximately 75% of cases, with facial diplegia in 50%. This can therefore be a very helpful sign in making the diagnosis. Loss of deep tendon reflexes is also an excellent finding if present, though this may not occur early.

TABLE 4

Clinical Symptoms and Signs

Weakness - mild <—> total paralysis
Usually begins in lower extremities

Sensory Deficit - peripheral
Loss of deep tendon reflexes

Cranial Nerve Involvement - in 75% of patients. All cranial nerves except olfactory have been involved. 7th most frequent.

Facial Diplegia - in 50% of cases. Bulbar palsy not uncommon.

Fisher's Syndrome - GBS plus ophthalmoplegia.

Miscellaneous - headaches, myalgia, respiratory distress and autonomic dysfunction.

Autonomic symptoms (Table 5) have been recognized in recent years as being a rather frequent accompaniment to GBS.[8] There can be increased or decreased sympathetic or parasympathetic activity or a combination of the two. There is usually no fever in an uncomplicated case of GBS. Blood pressure and respiratory symptoms are the most frequent autonomic changes. Fortunately, autonomic problems tend to disappear in approximately ten days after their onset.

TABLE 5

Autonomic Problems

Hypertension and hypotension.

Diminished cardiac output with edema, tachycardia, bradycardia.

Paresis of bronchial smooth muscle - reduced secretions, atelectasis.

Disturbance of thermal and sweating regulation.

Sphincter Abnormalities - bowel, bladder and sexual problems - infrequent.

Inappropriate ADH Secretion - vagal defect?

Generally, laboratory (Table 6) and microbiology studies are normal in the uncomplicated GBS case, unless there is an underlying condition such as porphyria, infectious mononucleosis or collagen disease. The spinal fluid protein is often elevated, maximum at two to eight weeks following the onset, and sometimes can be markedly elevated. Usually, the CSF cell count is less than ten cells per mm^3 with predominant mononuclears. EMG findings can be helpful if present but can remain normal. Approximately 20 percent of persons have normal EMG's throughout their illness.[9] Slowed conduction velocities, delayed distal latencies and F waves can suggest the diagnosis. If severe denervation is found, the prognosis for a full recovery is quite poor. It is best to test a large number of nerves for conduction velocity since the condition does not affect all nerves equally and simultaneously.[10-13]

TABLE 6

Laboratory

Normal lab and microbiology unless underlying condition such as porphyria, infectious mononucleosis or collagen disease.

CSF - elevated protein (max. at 2-8 weeks); usually less than ten cells, predominant mononuclears.

EMG - findings helpful when present. Slowed conductions and delayed distal latencies, F-waves. Later denervation may occur, and if severe, suggests a poor prognosis for a full recovery.

Evolution of GBS symptoms (Table 7) is usually complete in over 90 percent of patients by four weeks from the time of onset. There is some evidence to suggest that persons with slower evolution of symptoms do not recover as well. After the symptoms reach a maximum level, there is a stable period followed by the recovery phase. Approximately 85 percent have a good long-term recovery, but the remainder are left with long-term disability, usually sensory or motor problems of the distal lower extremities. Respiratory failure requires the use of a respirator in about 20-40 percent of cases.

TABLE 7

Clinical Course

Evolution of symptoms complete in >50 percent after two weeks; >80 percent after three weeks; >90 percent by four weeks.

A brief stable period follows.

Recovery phase then begins and is satisfactory in 85 percent of cases by four to six months.

Respiratory failure requiring use of respirator occurs in 20-40 percent of cases.

Prognosis (Table 8) can be difficult to predict. As indicated earlier, most persons eventually obtain a satisfactory level of function. A normal EMG at five weeks from onset suggests a good prognosis but severe denervation indicates a prolonged and perhaps incomplete recovery. A stable plateau longer than 18 days often suggests an incomplete recovery.[14] The mortality rate for untreated persons is approximately 30-40 percent, but even with the best of treatment, there remains a five percent or greater mortality in most series.[2-4] The majority of deaths result from respiratory failure but autonomic dysfunction and thromboembolism account for most of the remainder.[15]

TABLE 8

Prognosis

No specific predictors of consistent value, e.g. severity of disease, respiratory involvement, level of CSF protein.

Normal EMG at five weeks suggests good prognosis; severe denervation indicates a prolonged and sometimes incomplete recovery.

After symptoms have peaked, a plateau longer than 18 days usually heralds an incomplete recovery.

Majority (75-85 percent) of cases make a good functional recovery. Mortality rate with optimal treatment is approximately five percent, untreated approximately 30-40 percent.

Since there is no specific etiology known for GBS, no specific treatment (Table 9) is available. Particular attention to respiratory care is most important, along with excellent nursing care and a team approach by various physicians to prevent or correct complications. The vital capacity needs to be checked frequently during the progressive phase of the illness, with respirator intervention if it drops to a level of about one-third the expected normal. Physical therapy should be discouraged in the early phases or used very sparingly since relapses have been reported where too vigorous therapy has been applied.[5] Comfort medications such as Indocin or Tegretol are sometimes required for myalgia or paresthesias. Steroids have not been found to be helpful in GBS according to most authorities, and in some cases may even produce harm by causing a steroid myopathy. There is a variation of GBS known as chronic relapsing polyneuropathy which appears to respond to steroid medication.

TABLE 9

Treatment

No specific treatment.

Respiratory care - most important.

Excellent nursing care and total team approach to prevent complications.

Physical Therapy - gentle or none at first, as tolerated later to prevent relapse.

Plasmapheresis - valuable in some cases, especially early in the course or with respiratory complications.

Plasmapheresis appears to have considerable potential in arresting the course of GBS, particularly if applied during the immunologic and inflammatory states prior to actual demyelination of the nerve roots.[16] There is still a question as to whether there may be sub-populations of responders and non-responders and also as to the number of treatments and other parameters of treatment.

Discussion

Based upon the GBS literature, experience with a number of GBS patients, and now my own encounter with the syndrome, I would like to advance several observations and suggestions:

1. Stress and/or exercise often seems to precede the onset of GBS and many persons with this condition tend to be very active, achievement-oriented persons. A large proportion of the patients I have seen with GBS will even increase their exercise further as a remedy for the weakness, fatigue and myalgia that they are experiencing. Stress in the form of overwork or illness also appears to be a factor. Not only is denial a mechanism in the early phase of GBS, but also is involved in the unrealistic expectations for recovery. For example, I called my office from the hospital room and told them to cancel the appointments for one week and then I would be back. Three months later I started part-time work.

2. Fatigue is a big factor early in the course of GBS. I would define fatigue not simply as a dragged-out feeling, but as definite wearing down of muscle strength with repetitive activities such as walking, climbing stairs, etc. This feels very similar to what one would expect with myasthenia gravis. Early muscle testing should include repeated contractions against resistance, perhaps eight or ten times with each muscle tested. This could also be checked out by observing the person climbing stairs, carrying out knee bends, hopping on one foot, doing push-ups, etc.

3. Early, laboratory findings including lumbar puncture and EMG are mainly helpful in ruling out other disease processes. Later, the lumbar puncture and EMG are often useful in confirming the diagnosis.

4. Maximum attention should be directed toward respiratory care and autonomic function since these produce the mortality. The average hospital stay for GBS patients in the past has been in excess of 30 days. One should not allow DRGs or HMOs to jeopardize a patient's life for financial reasons. One should be certain before discharge that the plateau phase of the illness has been reached and the person is out of danger from complications.

5. As an economy measure, physical therapy can be kept at an absolute minimum, since it is often counter-productive, especially in the early stages. Heat and passive range of motion can be applied by the nurses or family members. A small home bathtub whirlpool is very helpful in reducing myalgia and eliminating the need for medication after the person goes home. A recliner chair is often much preferable to a hospital bed from the standpoint of comfort and convenience.

6. The three worst enemies for a person with proximal weakness of the lower extremities are standing, stairs and speed of movement. Bending forward at the waist will help lock the knees while standing. Leading with the weakest leg first going downstairs and the best leg first going upstairs is helpful. However, the patient should be encouraged to avoid all three of these activities as much as possible during early convalescence.

7. Plasmapheresis should probably be used as soon as a diagnosis can be made with reasonable certainty, particularly if the patient is rapidly progressing. If one waits until demyelination has occurred, then the recovery phase is likely to be much longer.

8. It is a great comfort to the patient to talk with someone else who has had the disease. This was very true in my own case, even though I have had a special interest in GBS for many years and have served as chairman of the medical advisory board of The National Guillain-Barre Foundation since its inception. I would be most happy to put the person in touch with former patients if this is desired. It is very important for the patient to realize that recovery is slow and that they should not look for improvement on a daily or even a weekly basis. However, within approximately one year's time, they will very probably reach complete or near-complete recovery.

Although I have had a special interest in GBS for a number of years, my understanding of the intricacies of the syndrome has greatly deepened with this personal experience. My enthusiasm for research into the etiology, early diagnosis and treatment of this condition is far more intense and urgent as a result of my encounter.

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Surgical Approaches for the Treatment of Subclavian Artery Injuries

Secondary to Blunt Thoracic Trauma

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Emergency exposure of the subclavian artery can be difficult because of the surrounding musculoskeletal structures. The surgical approaches used in the management of 15 patients treated for blunt injury to the subclavian artery are presented. These approaches included seven supraclavicular, five trap-door, one infraclavicular, and one posteriolateral thoracotomy. Choice of a particular surgical approach is governed by the side of the injury, the location of the injury, and the apparent severity of the injury. In this series, the operative approach used did not seem to affect postoperative mortality nor morbidity.

The majority of injuries to the subclavian artery are secondary to penetrating trauma.[1] The rarity of subclavian artery injuries secondary to blunt trauma is apparent in both military and civilian series.[2-4] The complex anatomy of the superior mediastinum and thorax provides a musculoskeletal tunnel for the subclavian artery. Although this tunnel decreases the probability of injury to the subclavian artery, it makes surgical exposure challenging. This report reviews the surgical approaches used with 15 patients treated at our trauma center with subclavian artery injuries secondary to blunt thoracic trauma.

Patient Population

Between 1968 and 1982, 15 patients with subclavian artery injuries secondary to blunt trauma were treated in our trauma unit. There were 12 males and three females. The patients' ages ranged from 16 to 43 years (average age 26 years). Table 1 lists the cause of injury in these patients. Ten of the patients sustained injuries to the left subclavian artery, and five sustained right subclavian injuries. Associated injuries were usually severe and are listed in Table 2. The most common injuries were long bone and rib fractures, hemop-neumothoraces, and brachial plexus injuries. One of the patients was receiving cardiopulmonary resuscitation on arrival to the trauma unit and expired before operative repair could be performed. The remaining 14 patients underwent angiography. An absent upper extremity pulse was the indication for angiography in most of the patients. Other indications for angiography were either wide mediastinum, persisting hypotension, chest hemorrhage, or apical pleural abnormality on chest x-ray.

Results

The surgical approaches used for repair varied among the operating surgeons, but were influenced by the location of the injury demonstrated by angiography. A supraclavicular approach was used in seven of the cases (Table 3). Two of these patients had injuries to the right subclavian artery; the remainder had injuries to the left. A trap-door incision was used in two patient for injuries to the right subclavian and in three patients for injuries to the left subclavian. There were no postoperative complications (Table 4) directly related to the trap-door incisions. One patient, who had a tear in the distal portion of the left subclavian artery under-

TABLE 1

Etiology of Subclavian Artery Injury

Event	*Number of Patients*
Automobile Accident	6
Motorcycle Accident	4
Crush Injury	2
Snowmobile Accident	1
Pedestrian-Auto Accident	1
Fall	1

TABLE 2

Injuries Associated with Subclavian Artery Injuries

Type of Injury	*Number of Injuries*
Facial Fracture	2
Closed Head Injuries	2
Abdominal Injuries	5
Brachial Plexus Injuries	8
Other Thoracic Injuries	18
Long Bone, Pelvic and Spinal Fractures	22

TABLE 3

Surgical Approach to Subclavian Artery

Subclavicular	7
"Trap-door"	5
Infraclavicular	1
Posterolateral Thoractomy	1

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TABLE 4
Postoperative Complications

Complication	Number of Patients
Pulmonary	8
Arm Contracture	1
Axillary Vein Thrombosis	1
Amputation	1

went repair via an infraclavicular transpectoral incision. The one patient whose subclavian artery was repaired through a left posterolateral thoracotomy was diagnosed by angiography as having an aortic injury near the subclavian artery. At surgery the injury was found to be, in fact, in the subclavian artery near its origin from the aorta. Considering the location of the injury, the approach remained the procedure of choice.

The method of operative repair varied. Synthetic grafts were used in four patients and vein grafts in two patients. Following debridement of devitalized tissue, primary anastomosis was possible in seven patients. One patient with a complete brachial plexus palsy underwent proximal and distal ligation of a pseudoaneurysm of the subclavian artery. The types of repair were not affected by the operative approach used.

Successful revascularization was possible in 12 of the 14 operated patients. In addition to the patient who underwent arterial ligation, the other patient with an unsuccessful revascularization had severe arm injuries which precluded restoration of blood flow beyond the brachial artery. Operative angiograms revealed that the graft and distal subclavian artery were patent but there was no flow beyond the distal brachial artery.

The postoperative complications are listed in Table 4. The most common complication was respiratory failure and pneumonia. Two of the 14 operated patients died postoperatively. Both patients died of respiratory failure secondary to severe pulmonary contusions. The operative approach had no effect on postoperative mortality or morbidity.

Discussion

Emergency exposure of the subclavian artery can be difficult because of the surrounding musculoskeletal structures. A surgical approach to the artery must afford quick proximal and distal control and, at the same time, be expedient. Earlier difficulties in obtaining these two goals is highlighted by reports of 17 different surgical approaches to the subclavian and innominate vessels.[5] The surgical approach is determined primarily by the location of the injury.[1,3,6] Left-sided injuries involving the origin of the left subclavian from the aorta are best approached via a left thoracotomy. The distal subclavian artery can be approached supraclavicularly. If necessary, proximal control can be obtained through a small left anterior thoractomy in the third or fourth intercostal space. If more exposure is required, an upper median sternotomy can be performed to connect the incisions. This approach is sometimes termed the trap-door exposure. Reported difficulties with this technique include loss of time, pleural entry, excessive bleeding, iatrogenic injury to the subclavian and innomiate veins, iatrogenic rib fractures, poor exposure secondary to the position of the sternal edges, and difficulty in wound closure.[3,7] Inadequate control of the internal mammary artery where the side of the sternum is divided can produce intraoperative or postoperative bleeding. A supraclavicular approach is adequate for most injuries distal to the vertebral artery. However, if a large supraclavicular hematoma or persisting thoracic hemorrhage is present, a left anterolateral third or fourth intercostal thoractomy should be performed initially for proximal control of the artery.

Good exposure for injuries to the right subclavian near its origin from the innominate can be provided by a supraclavicular incision. When necessary, the incision can be extended into a median sternotomy. Exposure can also be improved by a subperiosteal resection of the medial half of the clavicle. A supraclavicular incision is also adequate for injuries to the right subclavian which are distal to the origin of the vertebral artery. An upper median sternotomy is required for proximal control of the right subclavian artery when a large supraclavicular hematoma is present.

Placing a sandbag beneath the spine and rotating the chin toward the contralateral should facilitates exposure of the subclavian artery. Furthermore, when exposing the subclavian artery supraclavicularly, division of both the sternocleidomastoid and scalenus anticus muscles is necessary.

The improvement in vascular surgical techniques has made possible the successful repair of subclavian artery injuries. Different approaches to the subclavian artery are possible. Choice of a particular surgical approach, however, is governed by the side of the injury, the location of the injury, and the apparent severity of the injury. The specific method of repair, primary anastomosis versus graft interposition, is determined by the operative findings. In this series, the operative approach used did not appear to contribute to postoperative mortality nor morbidity.

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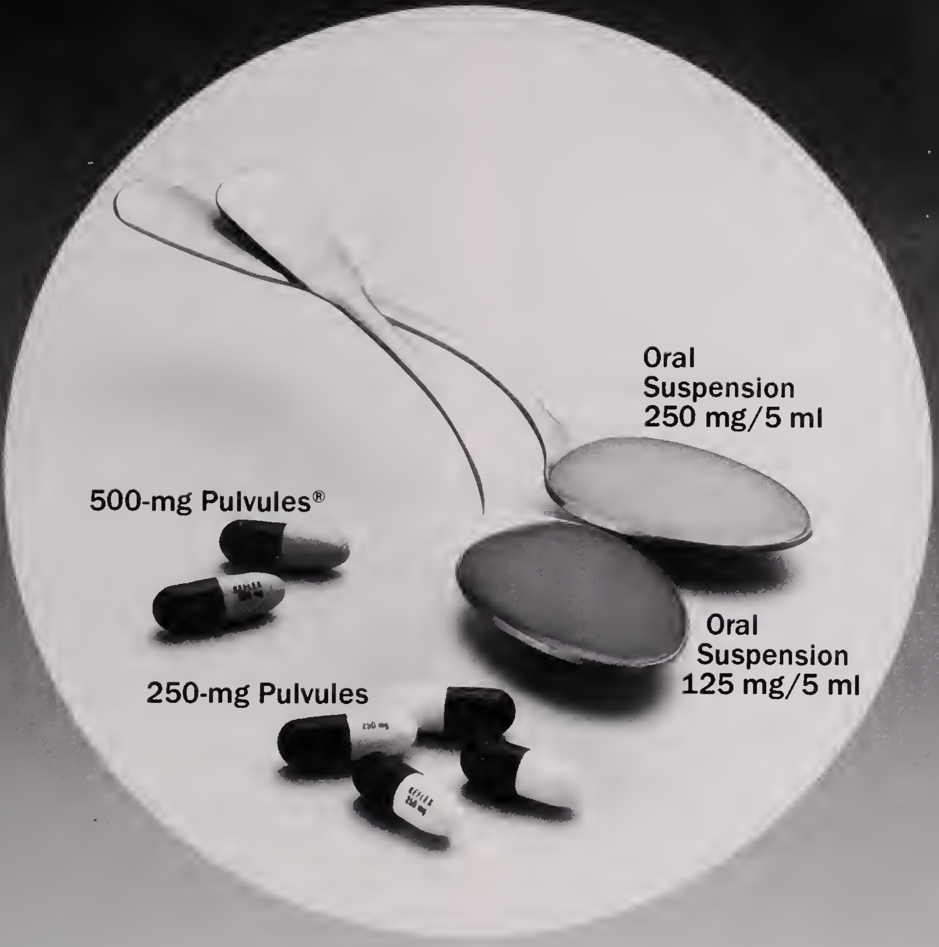
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Tay-Sachs Disease Prevention in Minnesota

Role of Physician Advocacy in Carrier Screening

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An organized screening program to detect carriers of the recessive gene for Tay-Sachs disease was operational in Minnesota from 1974 to 1977. Since that time, ongoing carrier testing for this fatal neurodegenerative disorder has been limited. Increased physician advocacy is required for continued information dissemination in order to prevent the tragic birth of babies with Tay-Sachs disease in this state.

Tay-Sachs disease is a fatal degenerative disease of the nervous system, characterized by the onset of severe mental and developmental retardation in the first year of life. The afflicted newborn appears normal and has no difficulty achieving early milestones. However, development slows between four to eight months of life, and neurologic impairment becomes apparent. The child progressively becomes blind, develops uncontrollable seizures, and eventually becomes weak and debilitated. The disease is uniformly terminal with death usually occurring by five years of age.

Tay-Sachs disease results from the totally deficient activity of the lysosomal enzyme, B-hexosaminidase A (Hex A), and the accumulation of its substrate, G_{M2}-ganglioside, primarily in the nervous system[1,2]. The disease is inherited as an autosomal recessive trait and has an ethnic predilection for Ashkenazi Jews (of Eastern and Central European ancestry)[3]. Approximately one in every 2,500 Ashkenazi Jewish infants is afflicted with this tragic disease, whereas the disease is extremely rare (1 in about 360,000) in non-Jewish babies. About one in 25 Ashkenazi Jewish individuals is a carrier of the Tay-Sachs gene. In one in every 625 Ashkenazic Jewish couples, both partners are carriers and, therefore, have a 25% risk of conceiving an afflicted child with each pregnancy. Siblings of known carriers have a 50% chance of being carriers. Furthermore, other blood relatives have a higher likelihood of being carriers than individuals in the general Ashkenazic Jewish population.

There is no treatment for Tay-Sachs disease. Enzyme replacement therapy was not successful due to the inability of administered normal Hex A to cross the blood-brain barrier[4]. Therefore, efforts have focused on prevention since the occurrence of the disease can be reduced markedly by carrier screening in the Ashkenazi Jewish population and by genetic counseling of at-risk "carrier couples"[5-7]. Carriers can be identified by the measurement of their Hex A activity in easily obtained sources such as plasma, leukocytes, and tears[8,9]. Because of 1) the high frequency of carriers among Ashkenazi Jews, 2) the availability of sensitive tests to detect carriers, and 3) the ability to diagnose this disease prenatally, voluntary screening and prevention programs have been conducted in Jewish communities[5-7].

In this communication, we report the results of carrier screening conducted from 1975 to 1977 by the Minnesota Tay-Sachs Disease Prevention Program and the subsequent experience with screening in Minnesota. In addition, the need for physician advocacy for Tay-Sachs screening in the 32,000 members of the Minnesota Ashkenazi Jewish population is emphasized.

Experience with Screening and Prevention

The success of Tay-Sachs carrier screening programs has made this disorder the prototype for the prevention of genetic diseases. Although the lack of physician awareness and advocacy has been a serious problem[10], the Jewish community has been extremely supportive of programs designed for voluntary mass-screening and prevention of this tragic disease. Since 1969 - the year Hex A was identified as the specific enzymatic defect[1] - more than 487,000 individuals worldwide (over 437,000 in North America) have been tested to determine whether they are carriers of the Tay-Sachs gene (Table 1). To date, over 19,000 carriers have been detected. Most importantly, over 480 previously unsuspecting carrier couples have been identified and informed of their 25% risk (with each pregnancy) of having babies affected with Tay-Sachs disease.

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The impact of the carrier screening programs for Tay-Sachs disease has been dramatic. It has called attention to the fact that this disease can be prevented by the identification and counseling of at-risk couples. Carrier couples can be informed of their various reproductive options, including (1) taking the 25% chance for an affected child, (2) not having children and/or adoption, (3) artificial insemination by a non-carrier donor, or (4) prenatal diagnosis. For the prenatal diagnosis of Tay-Sachs disease, amniotic fluid cells, obtained at about 16 weeks of pregnancy by transabdominal amniocentesis, can be cultured and then used to determine the level of Hex A activity. More recently, the prenatal diagnosis of Tay-Sachs disease has been made reliably by the direct assay of chorionic villi tissue obtained at nine menstrual weeks by chorionic villi sampling[11].

As shown in Table 1, over 1,300 pregnancies at risk for Tay-Sachs disease have been monitored since 1969. Of these, more than 760 pregnancies were in couples who previous had an affected child. Many of these families had decided not to take the 25% risk of having another affected child. With the availability of prenatal diagnosis and legalized selective abortion of affected fetuses, these couples opted to monitor their pregnancies in order to have only unaffected offspring. Even more remarkable is the fact that over 535 pregnancies of carrier couples identified by screening programs have been monitored. To date, over 250 fetuses were found to be affected with Tay-Sachs disease. The monitoring of over 1,300 pregnancies is impressive considering the fact that this is a rare genetic disorder and that the specific enzyme defect in Tay-Sachs disease was discovered only in 1969[2]. Clearly, the capability to prevent further cases of this disease by carrier identification and genetic counseling has proven to be an effective option to prevent this disease in at-risk families. However, the potential of this strategy has not been fully realized since Tay-Sachs babies continue to be born to Jewish couples.

TABLE 1

International Experience with Carrier Detection and Prenatal Diagnosis for Tay-Sachs Disease

Heterozygote Screening: 1969-1984

Adults screened world-wide	487,000
(Adults screened North America)	(437,700)
Heterozygotes identified	19,275
Heterozygote frequency	1 in 25
Carrier couples identified	483

Prenatal Diagnoses: 1969-1984

At-Risk Carrier Couple	*Pregnancies Monitored*	*Normal*	*TSD*
With a previously affected child	764	590	174
Identified by screening programs	538	453	85
Total	1,302	1,043	259

M.M. Kaback, personal communication, April, 1985.

Mass-Screening for Tay-Sachs Disease in Minnesota

The Minnesota Tay-Sachs Disease Prevention Program held mass-screening sessions in the metropolitan Twin Cities during 1975 and 1976. An extensive educational program was implemented. Information on the disease and the rationale for prevention by screening was disseminated through a variety of media and special educational seminars were provided to the religious and medical communities.

The Jewish population in the Twin Cities is estimated to be about 32,000, with greater than 98% being of Ashkenazi origin. During the voluntary screening sessions conducted in 1975 and 1976, 4,360 adults were tested. This represented about 13.5% of the total metropolitan Jewish population and at least 30% of individuals of childbearing age. Of the 4,360 screened, 159 carriers of the Tay-Sachs gene were detected, a frequency of 3.6% or about one in 28 individuals tested. Couples who were both carriers, and therefore at-risk for Tay-Sachs offspring, were identified and provided indepth genetic counseling.

Tay-Sachs screening programs directed at young couples often attract only a small proportion of the target population[12]. Participation in Tay-Sachs screening programs for persons over 18-years-of-age rarely exceeded 20% of the potential Jewish population. For example, a program directed at newlyweds in Montreal attracted only 10.8% of the targeted population[13].

Experience with Decentralized Screening in Minnesota

Since the mass-screening program was carried out in 1975 and 1976, testing for carriers of the Tay-Sachs gene in this state has been limited. Mount Sinai Hospital in Minneapolis, a major site of the 1975-1976 screening sessions, organized a subsequent carrier screening in 1981 with the cooperation of the hospital auxiliary. Although the importance and availability of Tay-Sachs screening was disseminated by local news stations, only 48 people were tested. In 1984, the Mount Sinai Hospital sponsored another Tay-Sachs screening day. In addition, Tay-Sachs carrier screening was available that year at the Shalom Home in St. Paul as part of a city-wide health fair. During these two screening sessions, a total of only 16 people were tested, presumably due to the limited publicity in the local media. In the initial mass-screenings conducted during 1975-1976, as well as in the subsequent Tay-Sachs screening sessions, testing was free. Costs were covered by support of Jewish community organizations and philanthropy. Therefore, there were no economic barriers to prevent concerned or at-risk individuals from being tested.

The results of Tay-Sachs carrier testing in Minnesota are summarized in Table 2. Complete records were obtainable only for the 1975-1976 screenings and for the years 1981 through 1984 from the two laboratories that currently perform the test in Minnesota, the Mayo Medical Laboratories and the University of Minnesota Biochemical Genetics Laboratory. Compared to the carrier detection frequency of 3.6% identified during the 1975-76 screenings, the frequency of Tay-Sachs carriers detected in the four year period from 1981 through 1984 was 11.1% of the 316 tested. The higher frequency of identified carriers was, in part, due to the fact that individuals tested during the latter screening sessions included relatives of previously detected carriers.

Clearly, the fact that only a small number of Jewish individuals are known to have been screened during the ten years since the initial mass-screening program indicates the need for increased physician awareness and advocacy for carrier testing if the tragedy of Tay-Sachs disease is to be prevented in Minnesota.

Who Should Be Tested

Optimally, couples should be referred to testing centers prior to pregnancy. However, if a couple has conceived, it is essential to have both individuals screened as soon as possible in order to have adequate time for prenatal diagnostic studies if both husband and wife are found to be carriers. It is also important to note that if artificial insemination of a Jewish woman is to be undertaken, it is necessary to screen the woman and all potential donors regardless of ethnic or geographic background. This also extends to couples where only one spouse is of Jewish ancestry; although the Tay-Sachs gene is much more prevalent among Ashkenazi Jews, it should be recognized that Sephardic Jews and gentile mates may carry the gene and should be tested.

TABLE 2
Minnesota Tay-Sachs Carrier Testing Results

Year	*Number Tested*	*Carriers Detected*	
		Number	*Percent*
1975-76	4,360	159	3.6
1981	100	13	13.0
1982	51	7	13.7
1983	70	8	11.4
1984	95	7	7.4
Total	4,676	194	4.1

The continued success of efforts to prevent Tay-Sachs disease depends on public education and on physician awareness and advocacy. It is the responsibility of every physician to offer Tay-Sachs testing to all individuals of Ashkenazi Jewish ancestry and to provide carrier couples with genetic counseling as to the various reproductive options available, including prenatal diagnosis. Only in this way, can this tragic disease be controlled.

Accuracy of Carrier Detection Methods

The identification of carriers can be made using serum, leukocytes, and/or tears[8,9]. The Hex A activity is determined either by manual or automated procedures. Using these assays, individuals affected with Tay-Sachs disease have no detectable Hex A activity, whereas carriers have about half the levels found in normal individuals. Most individuals can be designated as either carriers or non-carriers of the Tay-Sachs gene. However, the experience of many laboratories has indicated that when plasma or serum is used as the enzyme source, the assay does not reliably discriminate between carrier and non-carrier status in about 2-5% of the individuals tested[8,9]. Another limitation of the plasma assay has been the fact that a significant percentage of plasma samples from non-carrier women who are on oral contraceptives or are pregnant have low Hex A activities, resulting in false-positive values. For this group of individuals, the assay of Hex A using tears or isolated peripheral leukocytes as an enzyme source usually overcomes this problem. Thus, the tear and peripheral leukocyte assays provide the back-up tests which are essential to avoid the consequences of false-positive results, which in some instances can lead to an unnecessary amniocentesis or chorionic villi sampling. Since these tests require laboratories experienced in the interpretation and pitfalls of Tay-Sachs testing, a number of regional centers have been established throughout the country. All of these laboratories participate in an annual quality control program to ensure the accuracy of their test results.

Role of Physician Advocacy

In the absence of an active, organized screening program in Minnesota, the successful prevention of Tay-Sachs disease requires that the medical community be cognizant of the risk to Jewish couples and of the testing services available. Lack of physician awareness has been reported as a barrier to obtaining appropriate genetic counseling and Tay-Sachs testing. Studies indicate that physicians in various communities with Tay-Sachs screening programs were not a major source of initial testing information[10,14,15]. For example, only 31% of Toronto physicians whose practices served primarily Jewish individuals advised Tay-Sachs carrier screening, although 76% had been asked questions about such screening by their patients[16]. Studies also indicate that physicians failed to refer patients for testing, presumably most often due to inadequate physician awareness[10,14,17]. Such also may be the case in Minnesota. In a sample of carriers and non-carriers initially tested during the 1975-76 Minnesota mass-screenings, only 1.4% reported first learning of the Tay-Sachs screening program from a physician. Newspapers and synagogues, and, second, relatives and friends, were the sources of information about carrier screening most frequently cited by those who participated.

In the absence of an organized educational and screening program, it is increasingly important that practicing physicians in Minnesota identify couples at-risk and refer them for timely Tay-Sachs carrier screening. A decade has passed since the initial Minnesota Tay-Sachs screening. Ashkenazic Jewish children who have subsequently entered into childbearing years, the offspring of known carriers and the children of the majority of the Minnesota Jewish population that were never tested, should be informed of the importance of Tay-Sachs screening and should be referred for carrier testing. Increased reliance on physician referrals has occurred in other regions that do not have organized screening programs[18]. Such physician advocacy will be required to prevent the tragic birth of babies with Tay-Sachs disease in Minnesota.

Currently, Tay-Sachs carrier testing is available at the Biochemical Genetics Laboratory, University of Minnesota, Minneapolis, and the Mayo Medical Laboratories, Rochester. Additional information concerning Tay-Sachs carrier testing can be obtained from the National Tay-Sachs and Allied Diseases Association, 92 Washington Avenue, Cedarhurst, NY 11516, The National Foundation for Jewish Genetic Diseases, 401 East 34th Street, Suite 9C, New York, NY 10016, the March of Dimes Birth Defects Foundation, 1275 Mamaroneck Avenue, White Plains, NY 10605, or The Center for Jewish Genetic Diseases, Mount Sinai School of Medicine, Fifth Avenue at 100th Street, New York, NY 10029.

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Ted Peterson, M.D.—One Person's View of the Man

FRANK E. JOHNSON, M.D.

About 15 miles south of Interstate 80 and the Platte River, Theodore Andrew Peterson was born in Holdrege, Nebraska to Doris and Theodore August Peterson, the town's leading physician. Birth occurred on 12 August 1933 in the local hospital which was owned by Dr. Peterson. Delivery was by the father. Chance determined the place of birth to be America's heartland where the saying "one's word is one's bond" still applies and connotes an environment of openness, honesty, freedom and trust. Chance also determined that Ted was born to intelligent, caring parents. This family was completed when sibling brothers Rodney and Winston were added.

Lacking firsthand knowledge, I construct the story of his early years with gleanings from our conversations and from stories told by others who knew him. As always, luck was important at the start. Good genetic material for a sharp mind and sound body; nurturing environment at home and in the community. Ted did not squander his good luck; he built solidly upon it.

He was equal parts "city kid" (Holdrege, pop. 5635) and "farm kid." Ted spent summers as a hired hand on one of the several working farms controlled by his father. As a result, he was as much at home sitting on a tractor as on a horse rounding his dad's herd of buffalo. He had a normal boy's interest in machinery and at an early age became a skillful operator of every piece of farm equipment (how the self-image must have expanded with such glamorous adventure!). Authoritative knowledge about grains, crop rotation, cultivation, chemistry of fertilizers, animal care, breeding and butchering was acquired early and kept current for his life long. From his close association with the farmer and other hired hands, he took on certain of their mannerisms and phrases of speech which he never lost.

In free time before and after school or work and on Sunday or holidays, Ted was off to the Platte River which in summer gave up tasty catfish to the patient fisherman and in the fall was a wonderful place to hunt greenhead mallards and Canada geese. In season the corn fields and grasslands were plentiful with pheasants and grouse. I have the feeling that a fishing pole and gun were as familiar to Ted's hands as the dinner table knife and fork. He was a natural for the Boy Scouts, qualified for all the merit badges and rose steadily to Eagle Scout grade.

Ted was not aggressively competitive, but did like to win. He was a strong man on the high school football team and blew a horn in the school band.

His home was a solid rock where he could feel safe. He was taught a Christian religion and learned from his parents by word and example a strong moral and ethical code.

This period can best be described as idyllic.

He was off then to college at the University of Nebraska where he met Hannah Simonson, a nursing student and fellow Nebraskan.

After the premedical course at Nebraska, Ted moved to medical school at the University of Chicago. There he met a classmate who was to become his alter ego. They were both excellent students, but in other ways near opposites—attracting each other like the poles of a magnet. Joseph Kiser was from the coal mining area of West Virginia and a more spartan family background. He was working his way through medical school and had struggled hard to get there. Joe was fiercely competitive and earned his letter in college wrestling. Ted's manner was relaxed and slow moving; Joe's was tightly strung and in a hurry. Joe would be a strong influence on Ted for the rest of his life. It was this pair who together applied and were accepted into the rotating internship program at the Minneapolis General Hospital in 1957.

Meanwhile, the young nursing student from Nebraska had become a graduate R.N. and a skilled surgical nurse. She was also attracted to the Minneapolis General Hospital and to one of its interns. Ted and Nan married on June 16th, 1957 and, in due course, six sons resulted. As parents, they have every right to be proud of each of them.

Ted and Joe were accepted into Dr. Claude Hitchcock's five year general surgery training program. Both were outstanding residents. Ted more than once received the Best Teacher Award by vote of the medical students.

I also came to the General in 1957 as attending in thoracic surgery. In those early years, my private practice schedule allowed me to spend at least half time teaching in and out of the operating room at the General. This position gave me a tremendous advantage in choosing future associates.

At the completion of general surgery training, Kiser went to a group practice in Madison, Wisconsin. Ted expressed a desire to join me in practice. I was elated at the prospect. Over six years' observation, I had become impressed with his fund of knowledge, general as well as medical. His technical skill in the operating room made it a pleasure to operate with him. The friendly, quiet, tolerant, understanding demonstrated in his relations with patients, peers, superiors and subordinates was attractive to me. I knew that it would be a joy for me to work with Ted and we promptly went about designing a program which would qualify him for the Thoracic Surgery Boards. Happily, a good share of that program was a preceptorship with me. Ted passed his boards and we formed an association which was a happy one, but never more so than when we scrubbed together in the operating room.

Meanwhile, Kiser, perhaps sensing his path diverging from Ted's, again submitted himself and now wife, Pam, and two children, to the rigors of resident training in thoracic and cardiovascular surgery at the Mayo Clinic. At completion of that training, it seemed only natural that he should join Ted and me. We three became the Minnesota Thoracic Group, P.A. It was a productive combination, carried much farther than it otherwise might have been by the melding of three different character types who had a common desire to achieve excellence.

As one might imagine, given the background sketched above, Ted was comfortable with himself and others were comfortable with him too. What a wonderful trait for a physician, husband, father, friend. Ted never seemed hurried or harried, yet he accomplished much. Everyone was his friend and he was a friend to everyone. It was difficult to dislike Ted.

If it is the art of politics to reach consensus, then Ted was the consummate politician. He did not seek command but often found himself thrust into a leadership position. He accepted those positions at work, in the church and community as part of his social responsibility. The power that often accrues to leadership did not intoxicate or addict him.

Ted was able to hold separate from the demands of his profession, church, community, a portion of his life just for himself. This was a part of him which had never left Holdrege, Nebraska, the farm and Platte River. No one questioned. Everyone accepted. This was Ted.

Fortunately, retaining a portion of his childhood-adolescent period was not incompatible with living in the present. The same things which he had enjoyed as a Boy Scout made him a superior Scout Master. Scouting qualified as a church activity and helped to make religion more than a ritual for Ted. It was understood in our office that Ted would be off call for Scout meeting Tuesday evening each week and in August every year he would be off for a week or so with the troop on an adventurous trip. Ted had the ability to introduce excitement and mystery into even local excursions but as years went by, he returned to tell of experiences so thrilling that I could not help feeling envy. He made the last trip with his troop to the mountains of Montana just six months before his death and when he was already suffering the effects of an advancing malignancy. It was typical that he insisted upon carrying his own gear.

Just as regularly, he would be away for a long week around Thanksgiving when he would hunt the family farm and Platte River. He enjoyed teaching his own boys to hunt and equally enjoyed sharing the experience with friends and their sons. Eventually, so many doctors showed up for this annual event that Ted dignified the gathering by calling it the meeting of The Platte River Valley Medical Society. I never learned whether minutes were kept or if expenses for attending were considered tax-deductible by the I.R.S.

Ted seemed to love fishing equally with hunting. It was just that each had its season. He was an expert fisherman and could catch fish in the smallest puddle or stream (usually close to home so that he could get there quickly and often). A fish didn't have to be trophy size to excite him. And what stories he could tell about the one that broke his line.

To be Ted's kind of person and to live in harmony, which he did, absolutely requires one ingredient - a loving, confident and giving wife who is truly in love with her husband and selfless in caring for her children. Nan was and is all of the above. They were as well-mated as two people could be. Ted was lucky to have found her and was aware of his good fortune.

Removal of a cervical node in early 1983 established a diagnosis of carcinoma of the kidney. The source was quickly traced to the right kidney which was then removed. A course of Interferon, with its unpleasant side effects, was received for its potential suppressant effects. As the tumor escaped suppression, localized radiation therapy was applied for relief of specific symptoms. The final episode was mercifully brief and resulted from a bleeding but previously silent cerebral metastasis.

Ted survived two years after diagnosis. More importantly, he lived two years after diagnosis. Ted never returned to the operating room; not, I believe, because he wasn't fit, but rather it was one of the things he chose to give up as he rearranged his priorities. He continued to make hospital rounds and see consults. This was the part of practice he loved. It afforded the most opportunity for human contact (with patients, colleagues, friends). Ted's bedside manner had always been superior; I can only imagine how his compassion, understanding and healing capacity were increased during those last two years.

Hospital rounds were comfortably completed with a short morning's work. Then he was free to spend the day as he wished; most often he went directly home to Nan and family. He became interested in exploring his religion more deeply through Bible study. He never gave up the Scouts or fishing or hunting. A year before his death, he fished in Alaska and survived a dunking in an icy white-water stream. Six months before death, at a special ceremony, the Boy Scout Organization honored him for 22 consecutive years as a troop leader. Six weeks before death, I sat in a duck blind with him. It was a happy, memorable experience and not the least morbid.

Ted's last two years were spent as he had always lived, calmly, without hurry and without worry. Ted knew, understood and loved nature as few of us can. He had learned over and over that death is the inevitable result of living. He was able to accept his death as part of the natural process and not allow its imminence to interfere with his enjoyment of being alive. A direct quote heard when my wife Beryl and I with two other couples celebrated New Year's Eve at Ted and Nan's home at the end of 1984 clearly showed this character trait. Ted said, "on a scale of 100, I am living at the 99th percentile."

Nan's love for him was never more tested or more profoundly expressed than after the diagnosis of his fatal illness. She cherished each moment they could be together and yet was able to give him up to scouting adventures, to his hunting and fishing companions and other friends. As the disease took its toll and fatigue set in, he stayed near and became ever more close to the one whom I am certain was the most important person and only woman in his life.

It has been said that dying comments on the life it completes. If so, Ted's was a quiet, peaceful life, completely in tune with his God and nature. Those of us who knew him were immeasurably enriched in so many ways. The world will never be quite the same without him.

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Elevations of transaminases with and without concomitant elevations in alkaline phosphatase and bilirubin have been reported. Such elevations may disappear even with continued treatment; however, four cases of hepatocellular injury by verapamil have been proven by rechallenge. Periodic monitoring of liver function is prudent during verapamil therapy. Patients with atrial flutter or fibrillation and an accessory AV pathway (e.g. W-P-W or L-G-L syndromes) may develop increased antegrade conduction across the aberrant pathway bypassing the AV node, producing a very rapid ventricular response after receiving ISOPTIN (or digitalis). Treatment is usually D.C.-cardioversion, which has been used safely and effectively after ISOPTIN. Because of verapamil's effect on AV conduction and the SA node, 1° AV block and transient bradycardia may occur. High grade block, however, has been infrequently observed. Marked 1° or progressive 2° or 3° AV block requires a dosage reduction or, rarely, discontinuation and institution of appropriate therapy depending upon the clinical situation. Patients with hypertrophic cardiomyopathy (IHSS) received verapamil in doses up to 720 mg/day. It must be appreciated that this group of patients had a serious disease with a high mortality rate and that most were refractory or intolerant to propranolol. A variety of serious adverse effects were seen in this group of patients including sinus bradycardia, 2° AV block, sinus arrest, pulmonary edema and/or severe hypotension. Most adverse effects responded well to dose reduction and only rarely was verapamil discontinued. **Precautions:** ISOPTIN should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of excessive pharmacologic effects. Studies in a small number of patients suggest that concomitant use of ISOPTIN and beta blockers may be beneficial in patients with chronic stable angina. Combined therapy can also have adverse effects on cardiac function. Therefore, until further studies are completed, ISOPTIN should be used alone, if possible. If combined therapy is used, close surveillance of vital signs and clinical status should be carried out. Combined therapy with ISOPTIN and propranolol should usually be avoided in patients with AV conduction abnormalities and/or depressed left ventricular function. Chronic ISOPTIN treatment increases serum digoxin levels by 50% to 70% during the first week of therapy, which can result in digitalis toxicity. The digoxin dose should be reduced when ISOPTIN is given, and the patients should be carefully monitored to avoid over- or under-digitalization. ISOPTIN may have an additive effect on lowering blood pressure in patients receiving oral antihypertensive agents. Disopyramide should not be given within 48 hours before or 24 hours after ISOPTIN administration. Until further data are obtained, combined ISOPTIN and quinidine therapy in patients with hypertrophic cardiomyopathy should probably be avoided, since significant hypotension may result. Clinical experience with the concomitant use of ISOPTIN and short- and long-acting nitrates suggest beneficial interaction without undesirable drug interactions. Adequate animal carcinogenicity studies have not been performed. One study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. *Pregnancy Category C*: There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor and delivery only if clearly needed. It is not known whether verapamil is excreted in breast milk; therefore, nursing should be discontinued during ISOPTIN use. **Adverse Reactions:** Hypotension (2.9%), peripheral edema (1.7%), AV block: 3rd degree (0.8%), bradycardia: HR < 50/min (1.1%), CHF or pulmonary edema (0.9%), dizziness (3.6%), headache (1.8%), fatigue (1.1%), constipation (6.3%), nausea (1.6%), elevations of liver enzymes have been reported. (See *Warnings*.) The following reactions, reported in less than 0.5%, occurred under circumstances where a causal relationship is not certain: ecchymosis, bruising, gynecomastia, psychotic symptoms, confusion, paresthesia, insomnia, somnolence, equilibrium disorder, blurred vision, syncope, muscle cramp, shakiness, claudication, hair loss, macules, spotty menstruation. **How Supplied:** ISOPTIN (verapamil HCl) is supplied in round, scored, film-coated tablets containing either 80 mg or 120 mg of verapamil hydrochloride and embossed with "ISOPTIN 80" or "ISOPTIN 120" on one side and with "KNOLL" on the reverse side. Revised August, 1984 2385

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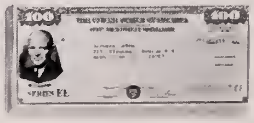

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Hog Lane Surgery (Ophthalmic Hospital, Canton, China)

JACK D. KEY, M.A., M.S.[*]; JOHN A. CALLAHAN, M.D.[†];
and WALTMAN WALTERS, M.D.[#]

A Historical Vignette on Selected Chinese Tumors from the Surgical Notes of Doctor Peter Parker and from Depictions in the Medical Art of Lamqua.

The eyes of the blind shall be opened,
and the ears of the deaf shall be unstopped . . .
the lame man shall leap as an hart,
and . . . the tongue of the dumb sing . . .
—Isaiah

It was early November 1835 and the place was #3 Fung-tae Hong on Hog Lane located in the "foreign" community of one of the best-known and notorious waterfront areas of the world. The city was Canton and the event was the opening, by Doctor Peter Parker (Figure 1), of the Canton Ophthalmic Hospital—the first hospital established in China.

> Diseases of the eye were selected as those the most common in China; and being a class in which the native practitioners are most impotent, the cures, it was supposed, would be as much appreciated as any other.[1]

His first patient was a woman with amaurosis in both eyes.

With impressive results for many of his initial ophthalmology cases, Doctor Parker very soon won the confidence and gratitude, even adulation, of those he served. In fact, almost overnight he had a full-sized practice and an overwhelming daily work load with literally a torrent of patients. Originally committed to affording relief for affections of the eyes, Doctor Parker subsequently experienced so many Chinese begging assistance for other complaints that soon every class of disease was being treated.

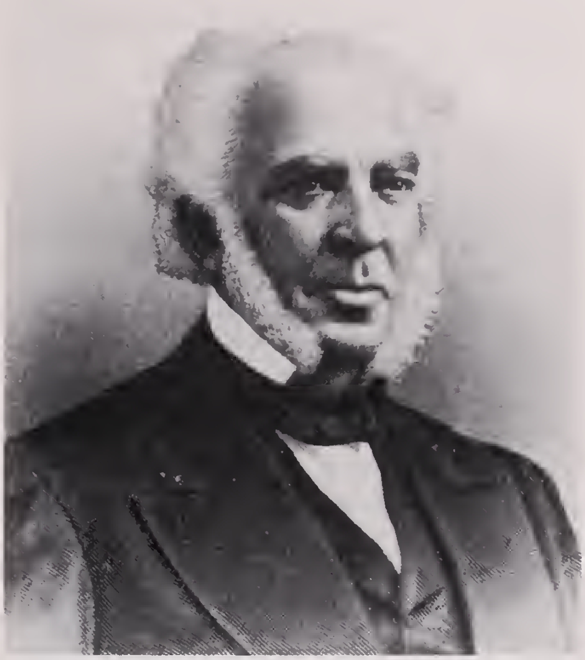

Fig. 1 - Peter Parker, M.D., 1804-1888. (Frontispiece from Stevens GB, Markwick WF: The Life, Letters, and Journals of the Rev. and Hon. Peter Parker, M.D . . . [initial edition, 1896]. Wilmington, Delaware, 1972. By permission of Scholarly Resources.)

During his 19 year tenure at the Canton hospital, Peter Parker would attend over 53,000 patients and effect many "firsts" in the annals of Chinese medicine. He established the first hospital (by occidental standards—and considering the circumstances—for the period); trained the first (by a Western medical missionary) Chinese medical student; did the first voluntary amputation; performed the first operation for cancer of the breast; had the first confinement case attended to in a Chinese hospital; performed the first operation in China for removal of stone in the bladder (lateral lithotomy); was responsible for the first use of sulphuric ether for surgery in China; and performed the first operation with chloroform anesthesia in China.

Detailed reports published in the journal *Chinese Repository* and the Lamqua paintings offer us a dramatic view of Peter Parker's surgery in China.[2] It should be pointed out that in addition to these reports, there are two invaluable published works which must be consulted for complete details concerning the life of this illustrious medical missionary. One of these is by Edward V. Gulick[3] and the other by George B. Stevens.[4] There are also a number of other interesting and helpful articles and books which should be consulted.[5-20]

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As the purpose of this vignette is to share selected accounts of Peter Parker's surgical experience with Chinese tumors (and their associated pictorial documentation) only very brief biographical details of his life are noted. More than this would be flagrant redundancy to the works cited relating to his life and times.

Peter Parker was born in Framingham, Massachusetts, June 18, 1804. Son of a "pious" farmer, he was carefully reared in the Orthodox Congregational faith and early in life felt that he was called to the ministry. He was first a student in Day's Academy (Wrentham) from 1826 to 1827 and then in Amherst College from 1827 to 1830. In 1830, Parker went to Yale from which he graduated the next year. He continued his studies in New Haven, concentrating on medicine and theology, and received the degree of M.D. in 1834. He had applied to the American Board of Commissioners for Foreign Missions, in 1831, to be a missionary. He was accepted, and subsequently assigned to China. On May 10, 1834, in Philadelphia, Peter Parker was ordained to the Presbyterian ministry and then in June sailed for Canton—the first Protestant medical missionary to China. On March 29, 1841, while on a visit to the United States, he married Harriet Colby Webster. In 1855, Parker discontinued practicing medicine and transferred his responsibilities for the Canton hospital to Doctor John G. Kerr. Then following several years of diplomatic service in China for the United States, he made his home in Washington, D.C. He died January 10, 1888.

Lamqua (Figure 2) was a Chinese artist who had trained with the famous portraitist, George Chinnery. For many years, Lamqua enjoyed an active business in Canton which catered to both Chinese and foreigners. Because he was so impressed with Doctor Parker's medical and surgical services to China and also from appreciation for Parker's training his nephew Kwan A- to be a surgeon, he offered to do paintings of patients (free of charge) as a way of expressing thanks. These paintings are usually focused on documenting gross pathology, especially that of tumors. Many of the Lamqua oil portraits of Parker's patients are extant today. There are at least 86 of these housed in the Yale Medical Library; 23 are in the Gordon Museum at Guy's Hospital, London; and one, in the Countway Medical Library, Boston. It seems probable that Lamqua did his original renderings in watercolors on rice paper. These were fairly small (7-1/3" x 10-3/4"). Then he would execute the portraits nearly life-size in oil. The Mayo Medical Library owns twelve of the rice paper renderings and from these come the illustrations for this paper. These are of special interest because they can be matched to

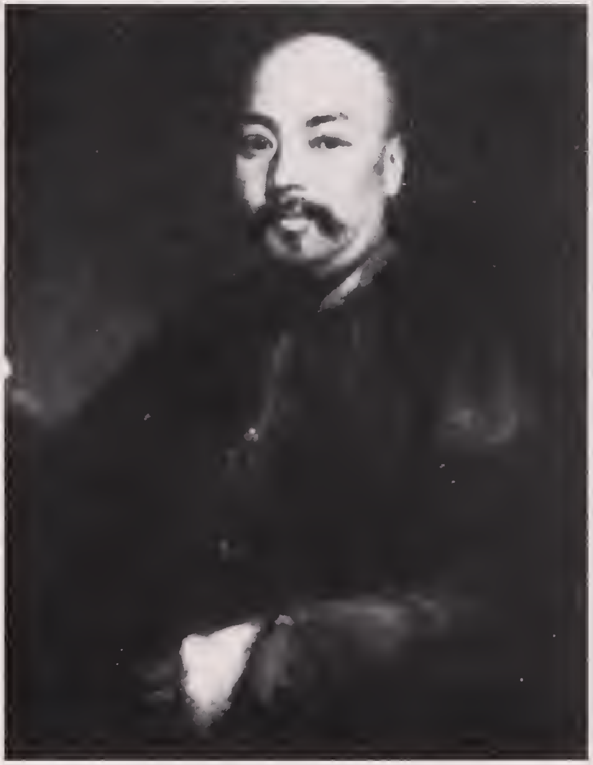


Fig. 2 - Lamqua self-portrait courtesy of Doctor Donald A. Johnson, Bethesda, Maryland and the Hong Kong Art Museum.

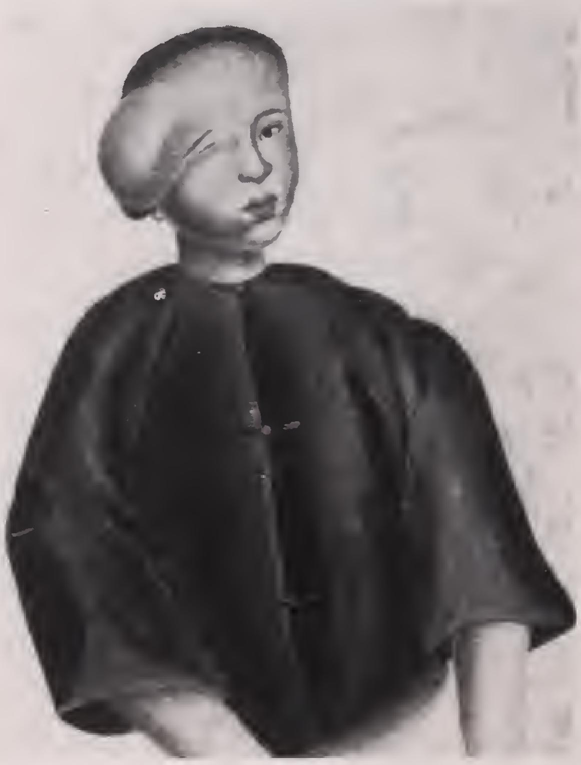


Fig. 3 - Case No. 446 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

case descriptions published in Parker's quarterly reports.

Parker's first operations to excise tumors took place in 1836 and the first for which one of our Lamqua paintings can be matched was case number 446. (The numbers refer to the order in which patients were presented and enrolled at the hospital.)

Case No. 446 (Figure 3), December 17th. Sarcomatous tumor.

Akae a little girl aged 13. As I was closing the business of the day, I observed a Chinese timidly advancing into the hospital leading his little daughter, who at first sight appeared to have two heads. A sarcomatous tumor projecting from her right temple, and extending down to the cheek as low as her mouth, sadly disfigured her face. It overhung the right eye, and so depressed the lid as to exclude light. The parotid and also its accessory gland were very much enlarged . . . Her general health was somewhat deranged; the tongue foul, pulse frequent and feeble, and the heat of the tumor above the natural temperature of the system. The blood vessels passing over it were much enlarged. The weight much accelerated its growth and occasioned pain at night in the integuments around its base. The child complained of vertigo, and habitually inclined her head to the left side . . . . From the first, it appeared to me possible to remove it; yet the possibility of unfortunate result, or even of the child's "dying under the knife," and the operations of the hospital being thereby interrupted or broken up, did not escape my thoughts. On the other hand, however, it was a case presented in divine providence, and it was evident that left to itself the tumor might terminate the life of the child, and from the accompanying symptoms, before a great length of time . . . . Having often in secret as well as in concert with others commended the child to the great Physician, I resolved upon the undertaking, with the precaution of procuring a written instrument and signed by both parents, stating the case, that the operation was undertaken at their desire, and they would exculpate me from censure, if the child should die in consequence of the attempt. Even the burial of the corpse was a subject of forethought and agreement with the father . . . On the 19th January, with signal blessing of God, the operation was performed . . . A few days previous to the extirpation, an evaporating lotion of the nit. potassa was applied to the tumor. An opiate was given fifteen minutes before, and wine and water during the operation. The patient cheerfully submitted to be blindfolded and to have her hands and feet confined. The extirpation was effected in eight minutes. Another small tumor of the size of a filbert was also removed from under the eyebrow. The loss of blood was estimated to be about 10 to 12 ounces. Not an artery required to be taken up. She vomited but did not faint. The tumor weighed one pound and a quarter. The circumference at its base was sixteen inches and three quarters, and the length of the incision from the top of the head to the cheek, ten inches. On opening it, I found portions of it becoming black, and two or three drachms of sanious blood, of a dark chocolate color, indicating that it had already taken on a diseased action. After a nap, the child awoke cheerful as usual; in the evening her pulse was accelerated, and she complained of nausea, but ever afterwards uniformly said that she had no pain. No inflammation supervened, and the wound healed by the first intention . . . In eighteen days the patient was discharged . . . .

Parker's case number 2152 (Figures 4 and 5) is thought to be the first voluntary amputation of a limb in China.

Case No, 2152. Amputation at the shoulder joint. Absorption of the os humeri and enlargement of the arm.

Po Ashing, aged 23, entered the hospital on the 3d of November. Six years since, he fell from a house and broke the humerus of the left arm, half way from the elbow to the shoulder, the lower portion passing upwards and backwards. Union so far took place as to render the arm serviceable, till six months since, in a crowd at a "sing song," it was again broken. From that time, according to his statement, the arm gradually became larger till it had attained its present enormous size. Beside being painful, the weight of it drew him quite one side; at several places it seemed ready to burst; the skin was bright and glistening, and the veins passing over it were numerous and much enlarged. There was no doubt of its containing fluid, and though no pulsation could be felt, apprehensions were entertained that the tumor might be of an aneurismal nature. November 14th, . . . I punctured the arm, supposing that possibly it might contain pus, and that the necessity of amputation might be avoided; yet prepared, if disappointed in this, to remove the arm. On opening the abscess, a dark greenish fluid escaped, with considerable force, but soon became darker and more bloody. Sixteen ounces were first discharged, but the character of the fluid was not decisive. In the hope that the blood was from some small vein divided by the incision, and that there was deep-seated pus, the lancet was reentered nearly its whole length; but the same discharge continued with a greater proportion of venous blood; thirty-two ounces in all were discharged, and the apperture closed . . . . the only chance of life was in the removal of the arm; but the exhaustion of the patient and absence of his father induced us to postpone the operation till the next day, unless subsequent symptoms forbade . . . . At 11 A.M., the gentlemen present the preceding day were ready, and all things were prepared for the amputation. The patient was seated in a chair supported around the waist by a sheet; the tourniquet was applied, also the subclavian artery secured by an assistant; a single flap was formed as recommended by Liston, the extent of the disease not admitting the use of the catlin as practiced by Cooper. With a large scalpel, two incisions were made commencing on either side of the acromion process, and meeting at the origin of the deltoid muscle, which was immediately dissected up: the capsular ligament divided, the head of the humerous turned out of the socket, and another stroke of the knife upwards dissevered the arm from the body. A gush of blood pointed out the axillary artery which was readily secured. The time did not exceed a minute from the application of the scalpel till the arm was laid upon the floor; the patient was then put upon a bed, and the pressure upon the artery removed. An excellent flap was formed, and dressings were applied as usual . . . The best representation of the arm after amputation, so far as shape is concerned, is that of a large ham of bacon. It weighed sixteen catties, equal to 21 1/3 pounds. Opening the arm at the place where it was punctured the preceding day, a dark coffee-colored fluid gushed out. There were eight or ten ounces of coagulated blood in the cavity first opened, which was bounded by a cist that formed the walls of others. It resembled cerus membrane. Opening other cavities, there was a similar discharge and a quantity of matter resembling putrid crassamentum, of a light and purplish color, or like the disorganized lungs of persons who have died of pulmonary consumption. Some of the cists contained nearly half a pint of fluid, &c. Traced the brachial artery from the axilla to the forearm, and also the veins. The artery was very small, about one tenth of an inch in diameter, and its coats thin; veins also small. The radial nerve was considerably enlarged. The bone was entirely absorbed, except an inch of each extremity. From these small portions a few spicula of bones projected. At the head of the humerus it appeared, till we discovered the absorption of the whole bone, as if nature had formed a new joint with the glenoid cavity within the head of the humerus. There were points of osseous matter, but the cists collectively were surrounded on the

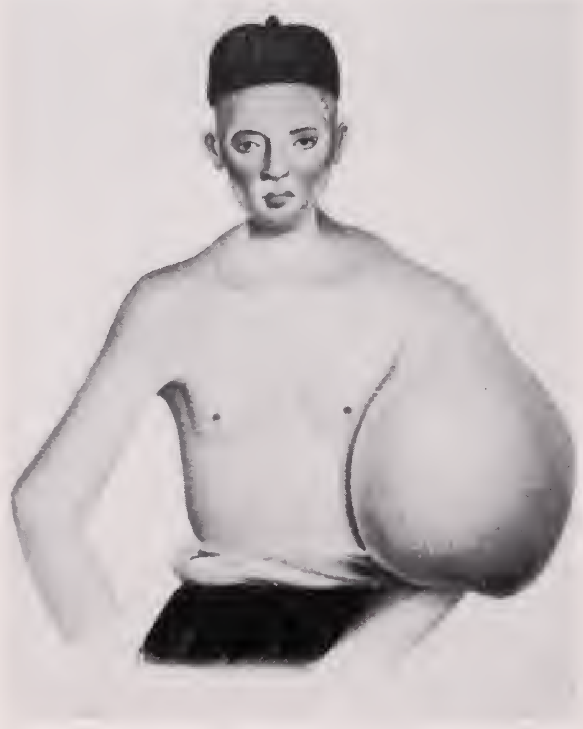


Fig. 4 - Case No. 2152 Preoperative painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

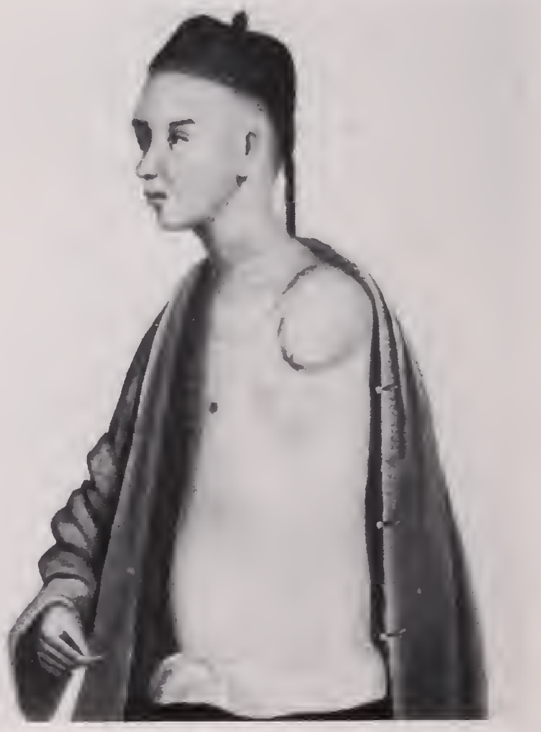


Fig. 5 - Case No. 2152 Postoperative painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

inside and back of the arm by a firm cartilaginous wall like the brisket of an ox, with tendinous fibres passing in every direction like the curly maple. The muscles were much diseased, and their tendons lost in the mass of cartilage, which near the elbow, was three or four inches in thickness. From the elbow downward, the muscles were perfect. The forearm was oedematous, and considerable adipose substance was found under the integument . . . . At 5 o'clock P.M., the patient having awoke from sleep, asked what he might eat. Congee was given. The expression of his countenance was good; he spoke with a natural voice, complained of cold, though his body was of a good temperature, the skin feeling natural, with a gentle perspiration upon the forehead. Not much oozing from the wound, but little pain, and he was quiet; his pulse was 126 . . . He occasionally started in his sleep, and when awake, spoke of his arm as if it were still on. From four till five o'clock, he slept quietly, and made no complaint of pain, though there were some febrile symptoms, and his tongue was white and the skin dry. At 6 o'clock sponged his body, and gave an ounce of Castor oil. Pulse from 4 o'clock 110: bowels were moved during the day, and all the symptoms became more favorable. On the 18th, the wound was dressed and found to be united, by the first intention, nearly the whole length of the incisions. Most of the sutures were removed. On the 21st, the dressings were changed again, and the remaining sutures slipped, and the wound had the most healthy appearance. Patients walks his room, his general health is good, and his strength fast restoring . . .

Case No. 2214 (Figure 6). November 21st. Sarcomatous tumor.

Lo Wanshun, aged 41. This interesting woman, of the first society of her native village, had been twenty years afflicted with a large tumor upon the left side of her face. It was situated below the ear, extending forward upon the cheek, and down upon the side of the neck so as nearly to touch the clavicle. As usual, the traces of the cautery and escharotics of the native practitioners were seen upon it; and the patient stated that it had been lanced, and the hemorrhage, in consequence was arrested with difficulty. After having attended to the general health, on the 15th December the tumor was successfully removed. The patient endured the operation with fortitude, characteristic of the Chinese. The loss of blood was considerable; she vomited but did not faint. She feared lest a large eschar might disfigure her face. By making the incision rather perpendicularly, from the ear towards the trachea, sufficient facial integument was preserved, to bring the wound behind and below the angle of the jaw. The wound healed by

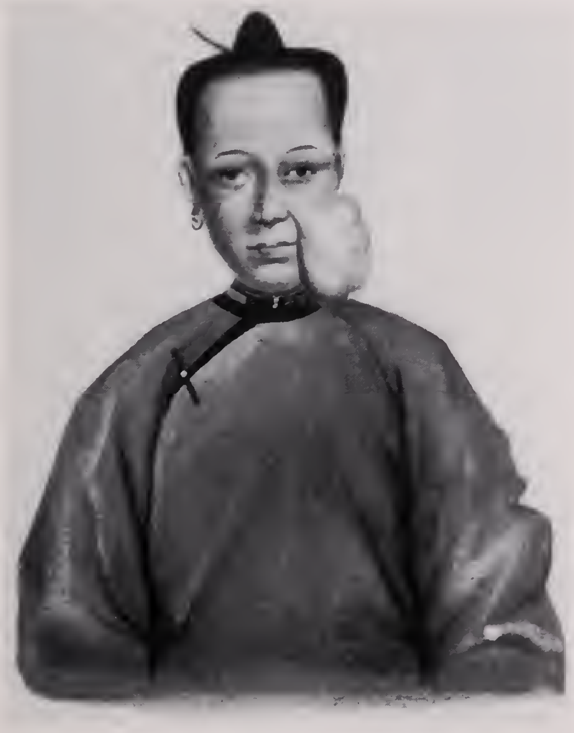


Fig. 6 - Case No. 2214 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

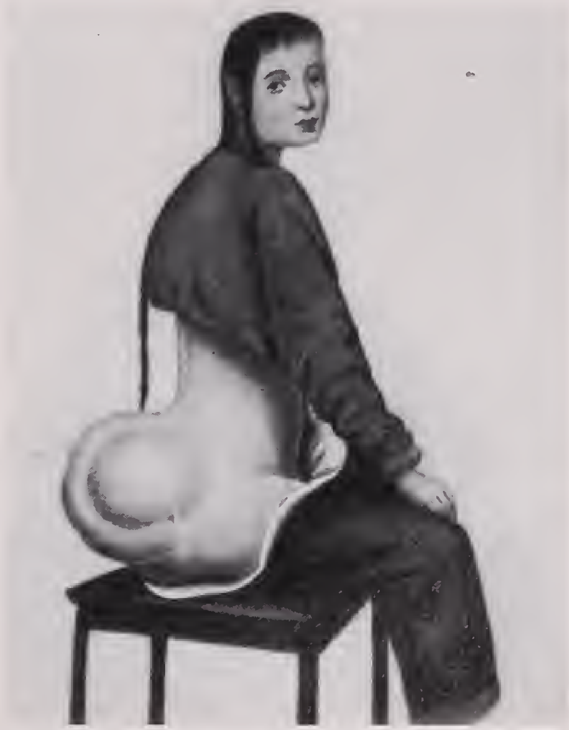


Fig. 7 - Case No. 3000 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

the first intention, and in ten days the dressing was wholly removed. The face had nearly its natural appearance. Grateful and happy, she returned to her husband and family.

Case No. 3000 (Figure 7). April 17th.

Lew Akin, aged 12 years, of Tsunchun, a village of Shuntih district, and the only child of her affectionate parents, had a steatomatous tumor upon the right hip, of a magnitude that required the patient to lean forward when she walked, in order to preserve her balance . . . On the 27th of April, the usual indemnity being given by the parent, the tumor was removed in two minutes and fourteen seconds. Its circumference (exceeding that of her body) was two feet at the base, and much larger at the middle: it was very slightly attached, and consisted of concentric layers of fatty substance, separated from each other by a surrounding cerous membrane, till near the centre it was found of a much firmer structure, resembling cartilage. It weighed five catties, or seven pounds avoirdupois. Upon the third day, the dressings were changed: union had taken place to a considerable extent. In one week the whole was so far healed that the child was able to walk in the room without pain to herself or injury to the wound.

Case No. 3488 (Figure 8). May 22d. Cartilaginous tumor.

Woo Pun, aged 41, a shoemaker of Pwanyu, had been afflicted seventeen years with a large unshapen tumor upon the left side of his neck. It hung pendulous from the submaxillary, extending backwards over the external jugular vein and carotid artery, forwards to the opposite side of the trachea, and downwards to the breast. For the last ten years its growth was rapid, and from its magnitude it had become very cumbersome. It was as large as the man's head, and so hard as not to yield to the pressure of the thumb. Centrally it was diseased, and having been perforated by the escharotics of a Chinese practitioner, it emitted a most offensive discharge. The aperture was half an inch in diameter, and as regular as if formed by a drill. The patient kept it closed with a stopple, every morning evacuating some ounces of offensive fluid . . . On the 19th June . . . the tumor was removed in about five minutes. Several veins of considerable size were divided. In making the inferior horizontal incision, an inch of the integument, above a large superficial artery, was not divided till the dissection of the tumor was nearly completed, and then, by compressing the artery before dividing it, very little blood was lost. The tumor was two feet in circumference, and weighed 7 lbs. The patient scarce uttered a groan. In twenty minutes he was comfortable in bed . . . and in one month was perfectly recovered.

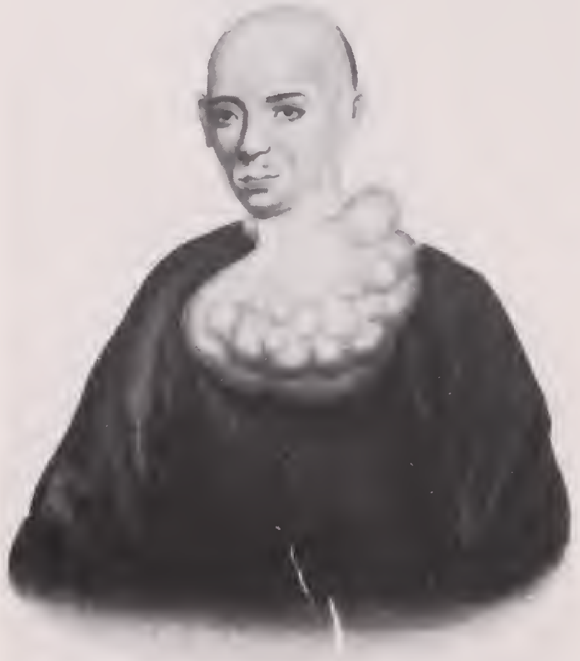


Fig. 8 - Case No. 3488 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

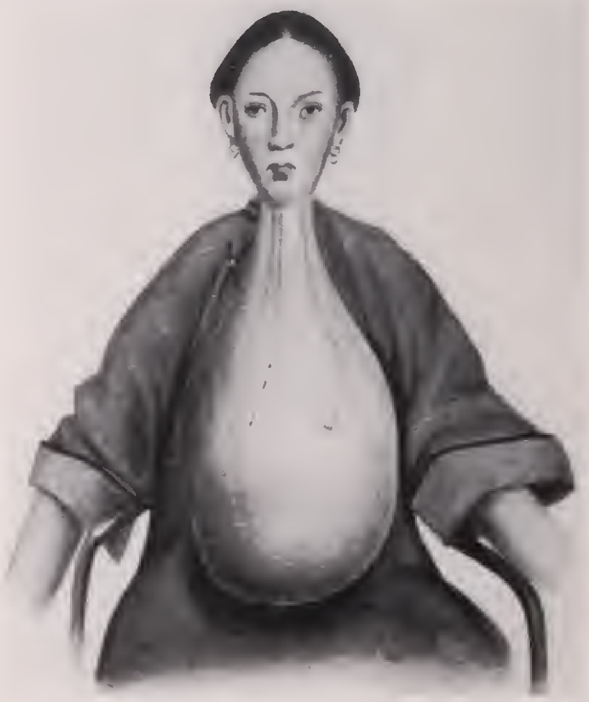


Fig. 9 - Case No. 3790 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

Case No. 3790 (Figure 9). June 19th. Sarcomatous tumor.

Yang She, aged 20, of Hwayuen, had a tumor pendulous from the chin and larynx. It commenced ten years since, and the last six years had been very cumbersome. The attachment beneath the chin was five inches in circumference. Centrally and horizontally it measured two feet three inches, and vertically three feet two inches. It extended below the umbilicus, but not so as to rest in the lap; consequently its weight was sustained by the attachment, and the patient had to sit constantly in a bracing posture, to prevent its drawing down her head. The natural features were distorted, the cheeks being drawn tense by the weight of the tumor. The muscles on the back of the neck were preternaturally large, having been in constant action . . . . Being in her fifth month, her case was the more critical . . . on the 21st June, the tumor was removed in 12 seconds, and the patient dressed and in bed in 24 minutes. Two arteries of considerable size required ligatures; the veins upon the lower side were very large, exceeding the natural size of the jugulars; the skin, fasciae, veins, and arteries formed the principal attachment. With the exception of a single point, an inch in diameter, the tumor was as distinct from the surrounding parts, as an egg from its nest . . . . Her first attempts to walk were awkward, having lost so much 'ballast.' In one week the healing process had far advanced . . . In seventeen days she was discharged quite well.

Case No. 4903 (Figure 10). Tumor of a peculiar character. March 5th.

Choo Yihleang, aged 31, a shoemaker of Kaouyaou, had a tumor on the right side of the neck, as large as his head, as it appeared from a front view. It was situated beneath the sterno-cleido-mastoideus muscle, and the superficial fascia. It extended from the ear to the clavicle, and from the trachea to the posterior edge of the above muscle, which was drawn very tense above it . . . The patient was blooming in health, and resolutely desirous of its extirpation. He was admitted to the hospital . . . On the 25th of April the operation was performed . . . . The incisions were made in the direction of the muscle, from the mastoid process to the clavicle. A small portion of the anterior edge of the mastoid muscle was divided . . . the tumor readily separated from its nidus, and in four minutes was completely out. A few small arteries that were divided soon contracted, and gave no further trouble; but two veins continued to discharge their contents so copiously that neither cold water or pressure would stop them, and ligatures became indispensable . . . The tumor weighed 5 1/3 lbs. It was surrounded by a firm wall an inch thick, resembling in hardness the full grown

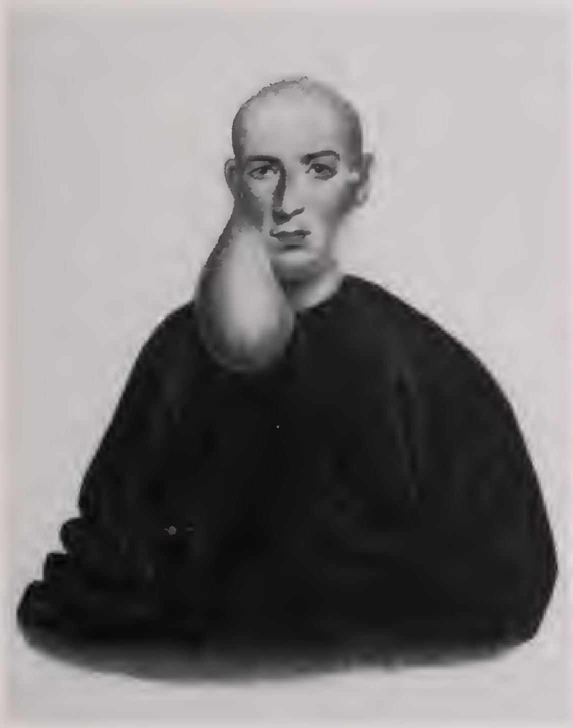


Fig. 10 - Case No. 4903 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

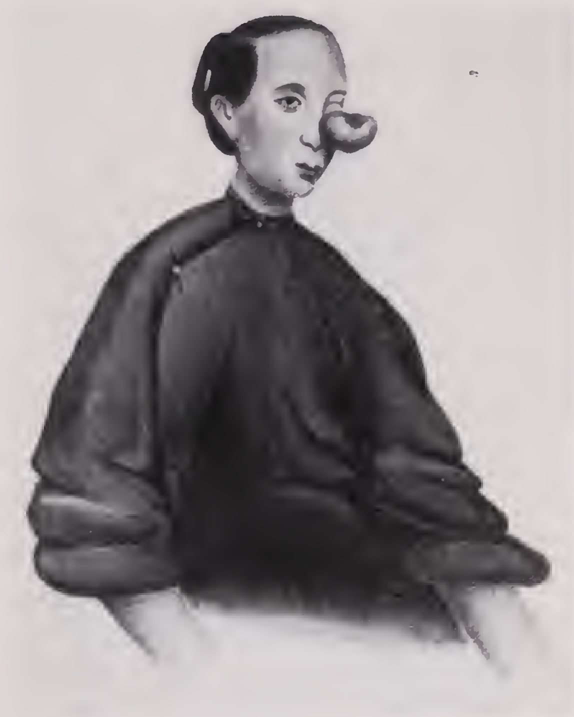
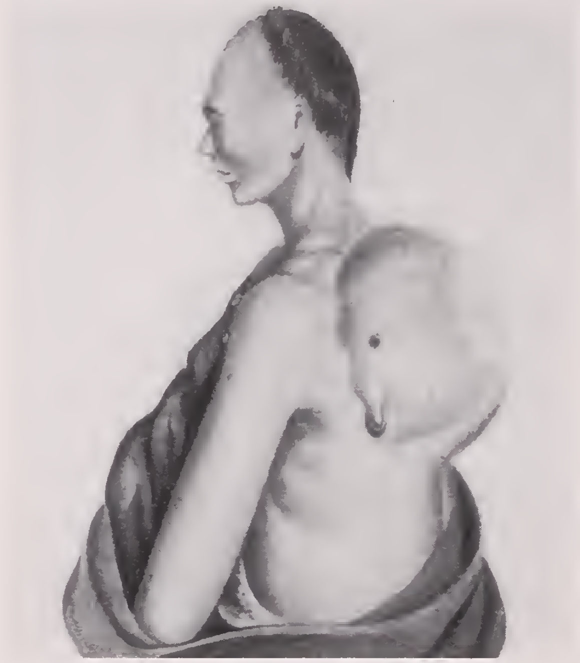


Fig. 11 - Case No. 12,397 painting by Lamqua. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

cocoa nut, except at one point: then came another layer of three quarters of an inch of white pulpy substance, and centrally there were several ounces of milky fluid quite inodorous. The large muscle resumed its natural place, the wound healed chiefly by the first intention and in twenty days the patient, in good health and with unequivocal sentiments of gratitude, returned to his family. Thus the case that appeared formidable in prospect, has really proved of less trouble than often attends the removal of a tumor but a hundredth part of its size. It has been the more interesting as being the first instance in which I have applied a ligature to a vein . . .

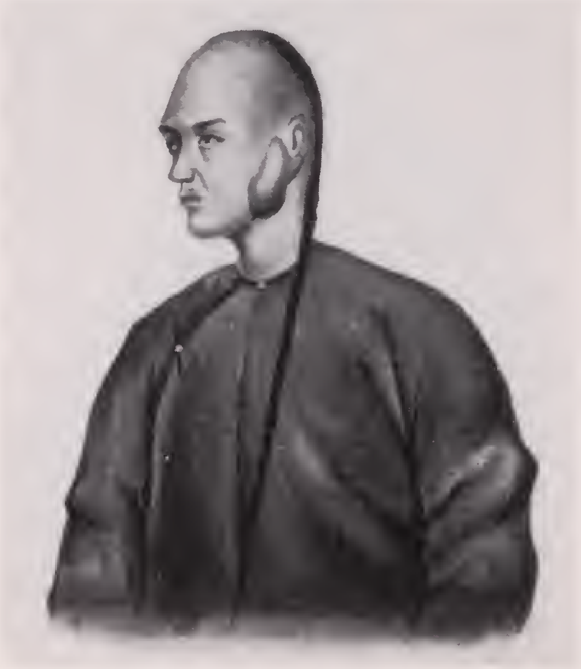


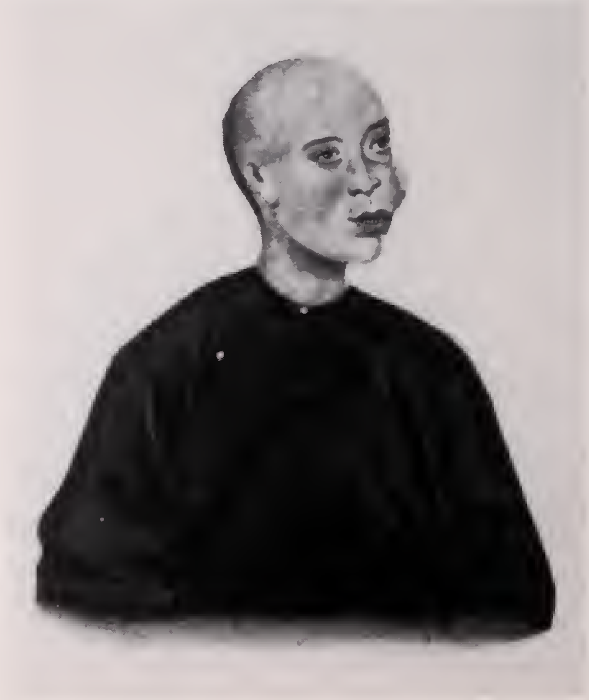
Figures 12-14 - Paintings by Lamqua. Case histories not presented. (Courtesy of the Mayo Medical Library, Rochester, Minnesota.)

Case No. 12,397 (Figure 11). November 6th. Tumor of the orbit of the eye.

Tau Shi, (age) 22, of Shuntih, had a tumor two inches in diameter, occupying the orbit of the left eye. The eye itself was much displaced by the pressure of the tumor which covered it and excluded the light, but the sight was perfect . . . the tumor was extirpated. It was found to originate from a point near the optic foramen. The profuse bleeding was arrested by dossils of lint dipped in tinct. ferri muriatis. For a few days the upper lid seemed likely to evert, but as the swelling subsided, it was restored to its natural position, confined by compress and adhesive plaster; and in fourteen days this young woman with her husband, who had stood by her during the operation, and uniformly treated her kindly, returned home perfectly cured. The eye had also in a considerable degree resumed its natural position from which it had been forced by the tumor.

Peter Parker was a pioneer medical teacher, a practitioner in touch with the advances in his profession, and a dynamic surgeon. He was an ophthalmologist but due to pressure from many patients and the realities of their needs he was





forced into many diverse fields of medicine. It appears that he did very well—his hospital and practice filled a great need as is apparent by the popularity of his medical service. As there is no evidence that Parker ever had any actual experience in operative surgery before he went to China the subsequent record is an amazing testimonial to self-confidence, natural skill and perhaps good luck.

The Chinese tumors seen by Parker are interesting. Gross pathology of these cases in the form of spectacular illustrations by Lanqua have been preserved as noted and provide excellent documentation of their presented conditions.

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Information and registration: Bonnie Young, CME, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; Phone 612/221-3977.

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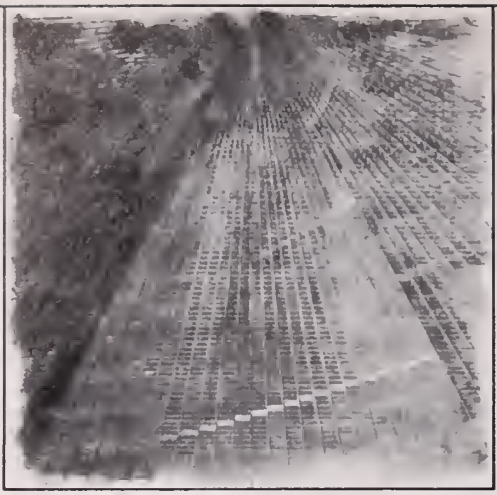

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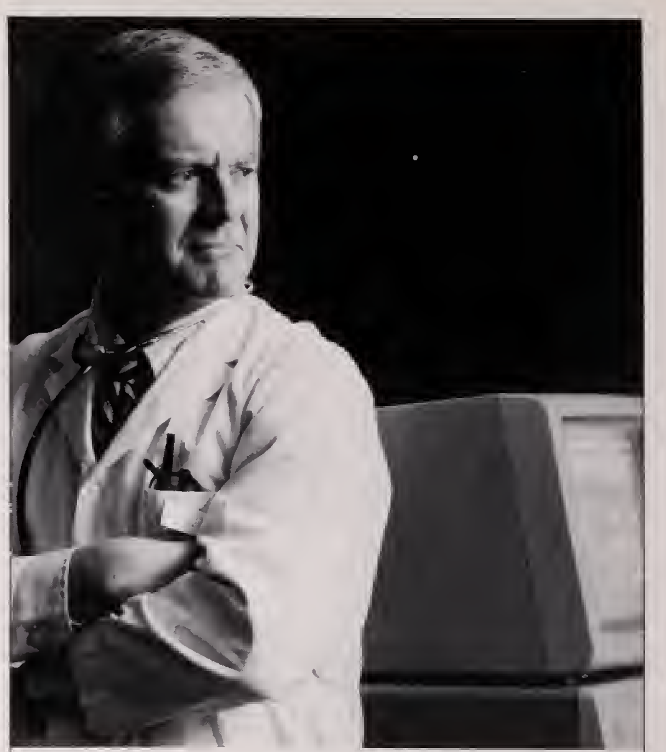

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Doctors Helping Smokers
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JOHN R. HUGHES, M.D.* and THOMAS KOTTKE, M.D.*

Many physicians believe advice about smoking cessation is ineffective, time-consuming, complex, and not a physician activity. As a result, physicians usually do not ask smokers to stop smoking. Several lines of evidence indicate these beliefs are inaccurate, and that brief, simple advice from a physician does help smokers stop smoking. We present a simple protocol for physician advice which we have found effective in our studies.

Less than one-fourth of smokers report their physicians have asked them to try to quit smoking.[7] Our research in training physicians to give cessation advice indicates five major reasons physicians fail to ask their patients to quit smoking.

1. **Physicians don't believe their advice is worthwhile**

Yet, physicians' advice to quit smoking is effective.[4] For example, Russell and colleagues had family physicians give a brief smoking cessation message to all their smokers, including those uninterested in quitting and those seen for symptoms unrelated to smoking. At the end of one year, 5.1% of those advised had quit compared to 0.3% of those not advised.[6] Wilson and colleagues had physicians give smokers a more intensive message and produced higher quit rates: 23% in the advice group and 12% in the control group.[8]

These success rates may seem discouraging to physicians. For some reason, many physicians believe that low success rates (i.e., 5%-25%) are acceptable for treatment of the consequences of smoking (e.g., lung cancer and COPD), but not for prevention of such consequences. We believe these success rates can have a substantial impact. For example, Russell noted that if each physician in Great Britain advised all of their smokers and achieved even a 5% quit rate, they would produce the same number of ex-smokers as 10,000 smoking clinics running full time.[6] And at much less cost!

Another reason to be optimistic about physician treatment of smoking is the introduction of nicotine gum.[1] In a second study, Russell and colleagues added nicotine gum to their brief message and increased one year quit rates from 5% to 11%.[5] These rates are remarkable because only half of the subjects bought and used the gum. Among those who used the gum, 35% quit.

We are conducting two similar trials. In one study, we train physicians to advise smokers for a few minutes, give booklets on smoking cessation, and give out free nicotine gum. This study focuses on smokers already interested in quitting. The other study is similar except we target all smokers, regardless of their initial motivation, and provide only a prescription for nicotine gum. Our quit rates are 35-40% in these studies.

2. **I don't have the time**

Many physicians believe they must spend lots of time teaching a smoker how to quit. However, physicians in the above-mentioned studies were effective when they advised their patients for less than ten minutes.

3. **Counseling is not a physician activity**

Many physicians believe they must "counsel" their smokers in order to get them to quit. These physicians are often discouraged because they see counseling as a complex and long process. However, counseling is unnecessary for most smokers. For example, the large majority of smokers (95%) quit without any counseling at all. Yet almost all these smokers seek advice from others. Successful ex-smokers often state direct advice and motivation from their physicians was helpful.

4. **Physicians don't want to embarrass their patients nor discourage them from returning**

Most every smoker has had family or friends ask them to quit or, at the least, to not smoke in certain situations. A physician asking a smoker to quit is much less embarrassing than these other requests. More importantly, smokers often interpret the physician's failure to ask him/her to quit as a sign that the physician believes smoking cessation is not important or that the smoker does not have the ability to quit.

5. **Advising smokers can be simple**

Table 1 illustrates a protocol we have developed from our studies of physician advice and

---

*Departments of Psychiatry and Medicine, Medical School and Division of Epidemiology, School of Public Health, University of Minnesota, Minneapolis, Minnesota.

Reprint requests to: John R. Hughes, M.D., Department of Psychiatry, University of Vermont, College of Medicine, Burlington, VT 05405.

smoking cessation. In the protocol, the physician first asks the patient if he/she smokes. If so, the physician asks the major symptom, disease, or risk of disease from smoking that concerns the smoker and then clearly states the reversibility of that symptom/disease/risk. Personalizing the adverse effects and reversibility of smoking is crucial. Statistics don't motivate the smoker; however, a specific symptom, disease and fear of disease will often motivate a smoker to try to quit. As a rule, ex-smokers can detect an improvement in *symptoms* (e.g., cough and shortness of breath) in *two weeks*. They can expect a substantial improvement in the major smoking-related *illnesses* (e.g., coronary heart disease) in *one year*. They can expect a normalization of the *risk* of diseases (e.g., lung cancer) in *ten years*.

TABLE 1

A Ten Minute Smoking Cessation Message

1. Do you smoke?
2. What about smoking worries you the most (i.e., which symptom, disease, or risk of disease)?
   2a. If you quit smoking you will notice the improvement in this symptom/disease/risk in two weeks/one year/ten years.
3. What is your biggest fear about smoking cessation?
   3a. See Table 2.
4. I want you to quit smoking. Can you make a commitment to quit on a certain date?
5. Do you think you will need some help in stopping?
   5a. Here is a list of smoking cessation clinics (See Table 3).
   5b. I recommend nicotine gum.
6. Please call one week after you quit and tell me how you are doing. If you can't reach me, I'll call you.

The physician then elicits what the smoker believes will be his/her biggest difficulty in trying to stop. To help the physician combat these concerns, we have developed a list of generic "comebacks" (Table 2) and a list of specific responses to the most common fears about smoking cessation (Table 3).

TABLE 2

How to Combat Fears about Stopping Smoking: Generic Responses

1. Withdrawal symptoms and craving are transient. They will decrease over time, usually in 1-2 weeks.
2. The smoker has conquered as tough or tougher problems before. Have them remember these to increase self-esteem.
3. Stopping smoking sometimes requires relearning coping skills for stress, etc. The most effective skills people can use are to:
   a) Take a walk, etc., as a temporary time-out to think things over.
   b) Get busy to distract themselves.
   c) Avoid stressful situations until they feel comfortable in these situations.
   d) Remember the major reason why they quit smoking.

After this preparation stage, the physician clearly states that he/she wants the patient to quit smoking. Persuading a smoker to make a personal commitment to quit on a specific date is very important. If a quit date is obtained, the physician should recommend options to help the smoker. He/she can refer the patient to a stop smoking clinic (Table 4). In doing so, the physician and patient should realize that most smokers quit without the help of a clinic, that there is no one best method of smoking cessation, and that the format (e.g., group vs. individual), intensity, and cost of smoking cessation clinics vary widely.

The physician can also prescribe nicotine gum.[1] If he/she does so, the physician should clearly state that the gum relieves withdrawal symptoms and, thus, is a temporary aid for smoking cessation. He/she should emphasize that the gum will not completely relieve the craving for cigarettes and is to be used for less than 3-6 months. Several studies indicate the gum is quite helpful for some smokers.[1] A major problem is that smokers stop the gum too soon either due to side-effects or to fear of dependence on the gum. We tell smokers the side-effects abate in 1-2 weeks and that dependence on the gum is rare.

Finally, the physician asks the patient to call one week after their quit date and describe how they are doing. If the patient fails to call, the physician or his nurse should call the patient. Recent studies have shown that knowledge of follow-up by a physician increases quit rates substantially.[3,8] Whether this is due to an "interest" factor or an "embarrassment" factor is unknown. This 1-2 minutes on the phone is time well spent.

At future visits, the physician should praise any continued abstinence from smoking. If the patient has not attempted to quit or has relapsed, the physician and patient should not be discouraged. Most smokers require 4-5 attempts before they stop;[2] thus, each cessation attempt should be viewed as a learning experience (as in falling off a bicycle) rather than as a failure.

Physicians should advise smoking cessation annually. A "smoker" sticker on the patient's chart is a helpful reminder to advise smoking cessation.

Conclusion

Much of the respect physicians have earned from the public is due to their determination to stick with patients through thick and thin. Physicians who repeatedly help smokers try to stop will likewise earn the respect of many ex-smokers.

TABLE 3
How to Combat Fears about Stopping Smoking:
Specific Responses

Fear	*Comeback*
1. I failed before, so I'll probably fail this time.	A. Less than 25% of smokers quit the first time. Most take 3-4 trys.
	B. Learning to stop smoking is like learning anything new: it takes several trys. Use learning to ride a bicycle as an analogy.
2. I will have unbearable cravings.	A. Most urges last less than 20 minutes.
	B. Use hunger pains as an analogy.
3. My friends smoke.	A. Decrease contact with smokers and avoid smoking situations until you are confident.
4. I will get irritable and frustrated. I will have difficulty concentrating.	A. Transiently decrease demands on yourself.
5. I will get restless.	A. Take walks or other time-outs.
	B. Handle objects.
6. I need the stimulant effect.	A. Increase activity and begin exercising.
	B. Work on getting better sleep (see below).
7. I will gain weight.	A. 1/3 of ex-smokers gain weight, 1/3 lose weight, 1/3 remain the same. Only 1/10 keep the weight on.
	B. Some of the weight gain is due to eating more sweets. Watch sweets.
	C. Some of the weight gain is due to decreased metabolic rate. Exercise combats this.
	D. Some of the weight gain is due to oral habits. Watch snacks.
8. I can't sleep.	A. Use bed only for sleep. Go to bed only when tired. No sleeping during day. Avoid caffeine at night. If not asleep within 30 minutes, get up. Exercise during day.

TABLE 4
Referral List of Smoking Cessation Clinics

These are the most widely available public smoking cessation clinics. The clinics often meet on an irregular schedule and their formats and fees change; thus, patients should call in advance of their quit date.

Program				
American Cancer Society	Positive reinforcement and small group discussions are emphasized. Group size is 10-15 people.	4 one-hour sessions	FREE	(612) 925-2772
American Lung Association	Small group discussion and motivation.	1 two-hour session	$10	(612) 871-7332
Seventh Day Adventists	Lectures, inspirational messages, films and group discussions. Group size is 20-30.	5 one-to-two hour sessions.	$10	(612) 545-8894

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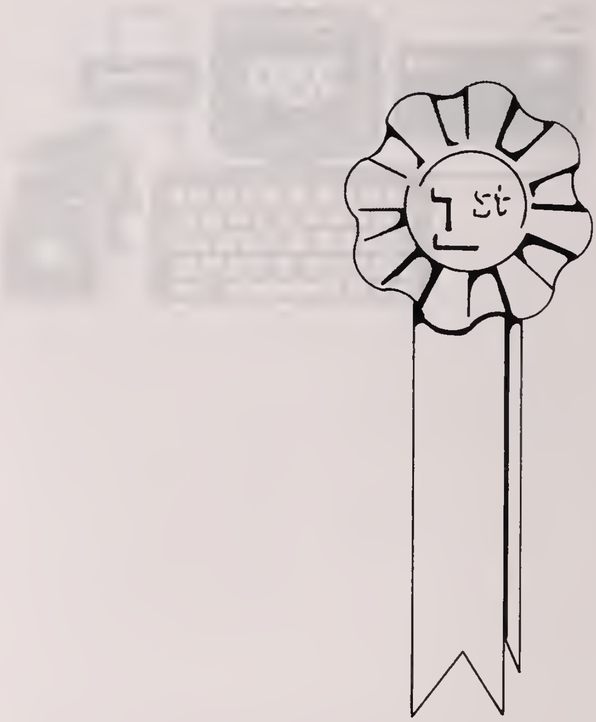

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Letters to the Editor

HMOs on the Iron Range

Dear Editor:

I read with interest your comments under Editor's Notebook published in Minnesota Medicine, Volume 68, November 1985, entitled "The Corporate Transformation of Medicine in Minnesota: Trouble on the Iron Range."

I agree with your overall assessment, especially regarding the threat of the Twin City HMOs. I thought you would be interested in my organizations's role in trying to work cooperatively with the Iron Range medical community - both hospitals and physicians - to ensure the continuing viability of, certainly our own organization, and the entire medical community.

We recognize the importance of keeping the Range medical dollars on the Range and the necessity to prevent "leakage" to other areas - especially Duluth. We are concerned with the expansion plans of large, downstate, off the Range HMOs, since these organizations do represent an immediate threat to diverting our Range medical dollars outside of our area.

Our organization, by its very nature, through our enrollment captures the medical dollars and keeps them in the community *except for those services that are not available on the Range.*

You certainly understand that under a fee-for-service arrangement, patients can and do seek medical care wherever they wish, and it is clear that a significant portion of the fee-for-service population on the Range seeks care elsewhere - primarily Duluth. Under our program, this is not permitted since all care must be rendered by or arranged for by the enrollees' participating clinic.

Both Central Mesabi Medical Center and the Virginia Regional Medical Center understand that our captured population is important to their institutions, and that the more enrollees we have the better off they are. It is for this reason both institutions are under a full capitation system with us; this provides them with important up-front cash flow dollars as well as guarantees them income even in the face of reduced admissions, length of stay, etc.

In the recent past, we concluded an agreement with a major tertiary care hospital in the Twin Cities for tertiary care services not available on the Range. This does not represent a threat. Quite to the contrary, it is a further means of controlling costs, which is especially important to our contracting clinics and does not set up a scenerio for leakage to the Twin Cities, since the distance is normally too great for Iron Rangers to seek primary care there. We had tried for years to make arrangements in Duluth -physician and hospital - without success, for a similar type of arrangement.

It is true that we do have physicians from the Twin Cities providing services at our own clinic in Virginia, and this is so because many of these physician specialty services are not available on the Range. Where they are available, the physicians in our non-affiliated clinics do not wish to work cooperatively with us, and this is unfortunate for all concerned.

You should know that on April 1, 1985 we purchased the LP Medical Specialists Clinic - *at their request*. This was so for many reasons. At that time we had on staff three physicians: OB-Gyn, Internist and Family Practice, and two Physician Assistants and a Nurse Practitioner. We have since then successfully recruited a Pediatrician, an Internist, a Family Practice Physician and a Surgeon, and have the services of a part-time Internist formerly affiliated with the Clinic. This recruitment was accomplished in spite of the adverse economic conditions on the Range, and it will certainly be of benefit to our local hospital here in Virginia.

We feel we are the real alternative for the Iron Range Medical Community to protect its own turf and, as noted above, we wish to work cooperatively with all providers on the Range - which I believe is in everyone's interest - certainly including the patient's.

By the way, our visiting physician specialists from the Twin Cities provide an additional advantage to our local Virginia Regional Medical Center Hospital - since services that can be done by them on the Range is part of our agreement with them, and they do not in any way represent a Twin City threat to the Range.

I would be pleased to provide you with more information on our organization and I hope you will contact me if you have any questions.

Lou Pizer, Executive Director
MORE HMO Plan, Inc.
Vermillion, Minnesota

More on Town and Gown

Dear Editor:

President Craig is exercising the rights of her office when she publishes her President's Letter in Minnesota Medicine, and we members are pleased to read her comments about the town and gown problems.

However, she is dead wrong when she demands that dissention within our professional ranks should be swept under the rug. She proves, in her intemperate remarks, why it was necessary that a pseudonym was used in naming the author of a journal story which was critical of gown.

We will never solve any of our problems in medicine until we get them out in the open and discuss them. The only criticism of our Editor that I can think of is his use of ponderous, non-punificent puns.

Edwin F. Luh, M.D.
Gem Lake, Minnesota

Our Religious Roots

Dear Editor:

Though Dr. Papermaster may be an excellent physician, his expertise in theology is patently at fault and his view of the historical setting of late Judaism and early Christianity is flawed and grossly inaccurate. I refer to his contention that the term "Hellenistic-Christian" is more accurate than the term "Judeo-Christian."

The best solution to the problem for which Dr. Papermaster seeks an answer is to examine the historical roots involved. A good sequential historical analysis is to be highly valued whenever a person faces a puzzling situation of unknown depth; for example, the examining physician unconsciously chooses this approach when faced with a diagnostic dilemma. A historical view of that remarkable branch of humanity called the Jews, together with a view of their unique history recorded chiefly in the Old Testament but also assuredly in the New Testament, will yield light on the proper choice: "Hellenistic-Christian" or "Judeo-Christian." To settle the question then, we appeal to the common roots of two of the world's greatest religions, Judaism and Christianity. Any school boy, of whatever age, knows those roots to be the Old and the New Testaments.

If the Old Testament (OT) is anything it is assuredly Jewish, cherished and followed by a large segment of the Jewish people. Though the New Testament (NT) is considered by some to be a Christian treatise, it is undeniably Jewish as well. Bear in mind that the authors of the 27 books in the NT were all Jewish with the exception of Luke, who, oddly enough, was a top-flight Gentile physician. An open-minded study of the Jewish manuscript (OT) and the Christian counterpart (NT) reveals a broad bridge connecting the two; what's more, traffic is bi-directional and remarkably orderly. In order to understand the message of the NT one reads it *and* the OT. Conversely, to understand the message of the OT one is well-advised to read and study the NT. The obviously later-derived NT writings are saturated with quotations from the OT. A careful analysis of the NT will show that Christ, a Jew, revered today by 600,000,000 Christians, quoted from 22 of the 39 books in the OT. Further, the four Gospels (Matthew, Mark, Luke and John) have 67 readily apparent quotations from the OT. The NT book called Hebrews has 85 direct quotations and allusions to the OT. And the last book in the NT - Revelation - has an astounding 245 references to the OT! We maintain that the Jewish OT and the Gentile NT are inseparably related and must be studied together to get the best out of both.

We acknowledge the fact that the NT was written in Greek, but this was due solely to the fact that Greek was the *lingua franca* of the entire Roman (and Jewish) world from 300 B.C. to 500 A.D. Not surprisingly, all the early leaders of the new Christian religion were Jews, trained in the Jewish traditions and writings.

I am sold on CME (continuing medical education) and pursue it with vigor. I am also an avid enthusiast of CTE (continuing theological education) which gives me delight, erudition, and a rich view in depth of man and his cosmos. Dr. Papermaster should not only agree to the value of CME, but he should accept my kind and imploring invitation to begin CTE at his earliest convenience.

J. B. Friberg, M.D.
Minneapolis, Minnesota

A Solo Voice

Dear Editor:

As a solo primary care physician in a rural community, I do really appreciate your stimulating and thoughtful article in the "Editor's Notebook." Great! Thank you.

H. A. Knoche, M.D.
Gaylord, Minnesota

Cover Photograph

Kentucky Wild Flower

Robert P. Nelson, M.D., from St. Paul, took the cover photograph of this "Kentucky Wild Flower" near Calhoun, Kentucky. He used an Olympus 33MM camera with a macro zoom lens.

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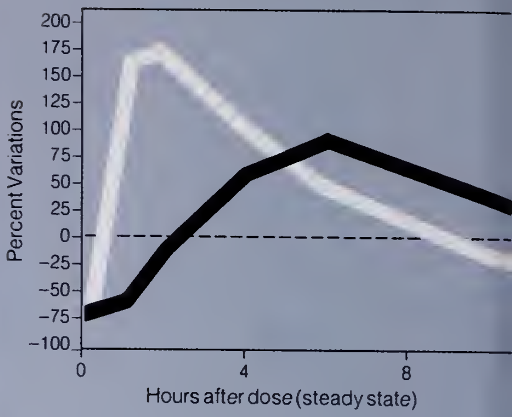

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Smooth blood pressure control and well tolerated

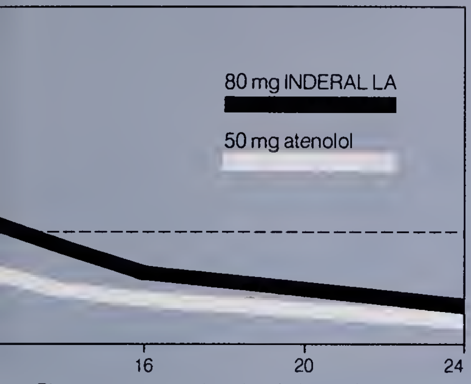
Once-daily INDERAL LA (propranolol HCl) keeps life simple for the patient. A single dose provides 24-hour blood pressure control. Convenient and well tolerated, INDERAL LA rarely interferes with everyday living. In fact, a recent study of 138 patients found a low incidence of side effects with INDERAL LA, which was not significantly different from that reported with metoprolol and atenolol.[2]

INDERAL LA should not be used in the presence of congestive heart failure, sinus bradycardia, cardiogenic shock, heart block greater than first degree, and bronchial asthma.

Once-daily
INDERAL® LA
(PROPRANOLOL HCl) **Long Acting Capsules**

Please turn page for brief summary of prescribing information.

atenolol over 24 hours*[1]



*Plasma concentrations in relation to the mean.

- Smooth, consistent plasma drug levels over 24 hours
- Full, 24-hour blood pressure control with INDERAL LA

and feeling good.

Added blood pressure control with the preferred diuretic

When more than one antihypertensive agent is needed, once-daily INDERIDE LA enhances patient compliance to improve long-term control. Patients receive all the benefits of controlled-release INDERAL LA *and* standard-release hydrochlorothiazide (HCTZ), for comfortable morning diuresis. Not only does this regimen permit patients to follow normal daily routines, but HCTZ also produces less potassium wastage on a mg-for-mg basis than chlorthalidone.[3,4]

Once-daily
INDERIDE® LA
(PROPRANOLOL HCl (INDERAL® LA)/HYDROCHLOROTHIAZIDE)

As with all fixed-combination antihypertensives, INDERIDE LA is not indicated for the initial treatment of hypertension.

Please turn page for brief summary of prescribing information.

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INDERAL® LA

(PROPRANOLOL HCl) LONG ACTING CAPSULES

80 mg
120 mg
160 mg

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BRIEF SUMMARY *(FOR FULL PRESCRIBING INFORMATION, SEE PACKAGE CIRCULARS.)*

INDERAL® LA Brand of PROPRANOLOL HYDROCHLORIDE **(Long Acting Capsules)**
INDERIDE® LA Brand of PROPRANOLOL HYDROCHLORIDE (INDERAL® LA) and HYDROCHLOROTHIAZIDE **(Long Acting Capsules)**
INDERAL LA AND INDERIDE LA Capsules should not be considered simple mg-for-mg substitutes for INDERAL and INDERIDE Tablets. Please see package circulars

CONTRAINDICATIONS

Propranolol hydrochloride (INDERAL® LA): Propranolol is contraindicated in: 1) cardiogenic shock, 2) sinus bradycardia and greater than first degree block. 3) bronchial asthma; 4) congestive heart failure (see WARNINGS) unless the failure is secondary to a tachyarrhythmia treatable with propranolol.

Hydrochlorothiazide: Hydrochlorothiazide is contraindicated in patients with anuria or hypersensitivity to this or other sulfonamide-derived drugs

WARNINGS

Propranolol hydrochloride (INDERAL® LA): CARDIAC FAILURE: Sympathetic stimulation may be a vital component supporting circulatory function in patients with congestive heart failure, and its inhibition by beta blockade may precipitate more severe failure. Although beta blockers should be avoided in overt congestive heart failure, if necessary, they can be used with close follow-up in patients with a history of failure who are well compensated, and are receiving digitalis and diuretics. Beta-adrenergic blocking agents do not abolish the inotropic action of digitalis on heart muscle.

IN PATIENTS WITHOUT A HISTORY OF HEART FAILURE, continued use of beta blockers can, in some cases, lead to cardiac failure. Therefore, at the first sign or symptom of heart failure, the patient should be digitalized and/or treated with diuretics, and the response observed closely, or propranolol should be discontinued (gradually, if possible).

> IN PATIENTS WITH ANGINA PECTORIS, there have been reports of exacerbation of angina and, in some cases, myocardial infarction following *abrupt* discontinuance of propranolol therapy. Therefore, when discontinuance of propranolol is planned the dosage should be gradually reduced and the patient carefully monitored. In addition, when propranolol is prescribed for angina pectoris, the patient should be cautioned against interruption or cessation of therapy without the physician's advice. If propranolol therapy is interrupted and exacerbation of angina occurs, it usually is advisable to reinstitute propranolol therapy and take other measures appropriate for the management of unstable angina pectoris. Since coronary artery disease may be unrecognized, it may be prudent to follow the above advice in patients considered at risk of having occult atherosclerotic heart disease who are given propranolol for other indications.

THYROTOXICOSIS: Beta blockade may mask certain clinical signs of hyperthyroidism. Therefore, abrupt withdrawal of propranolol may be followed by an exacerbation of symptoms of hyperthyroidism, including thyroid storm. Propranolol does not distort thyroid function tests.

IN PATIENTS WITH WOLFF-PARKINSON-WHITE SYNDROME, several cases have been reported in which, after propranolol, the tachycardia was replaced by a severe bradycardia requiring a demand pacemaker. In one case this resulted after an initial dose of 5 mg propranolol.

MAJOR SURGERY: The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial. It should be noted, however, that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures.

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)—PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS. INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA: Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes. In these patients, it may be more difficult to adjust the dosage of insulin. Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. In patients with impaired renal function, cumulative effects of the drug may develop.

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs. Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs.

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL: Propranolol should be used with caution in patients with impaired hepatic or renal function. Propranolol is not indicated for the treatment of hypertensive emergencies.

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure. Patients should be told that propranolol may interfere with the glaucoma screening test. Withdrawal may lead to a return of increased intraocular pressure

CLINICAL LABORATORY TESTS. Elevated blood urea levels in patients with severe heart disease, elevated serum transaminase, alkaline phosphatase, lactate dehydrogenase.

DRUG INTERACTIONS. Patients receiving catecholamine-depleting drugs, such as reserpine should be closely observed if propranolol is administered. The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity, which may result in hypotension, marked bradycardia, vertigo, syncopal attacks, or orthostatic hypotension.

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY: Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential. In 18-month studies, in both rats and mice, employing doses up to 150 mg/kg/day, there was no evidence of significant drug-induced toxicity. There were no drug-related tumorigenic effects at any of the dosage levels Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY: Pregnancy Category C. Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose. There are no adequate and well-controlled studies in pregnant women. Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Once-daily

INDERIDE® LA

Each capsule contains propranolol HCl (INDERAL® LA, 80 mg, 120 mg or 160 mg and hydrochlorothiazide 50 mg

80/50
120/50
160/50

The appearance of these capsules
is a registered trademark
of Ayerst Laboratories.

NURSING MOTHERS: Propranolol is excreted in human milk. Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE: Safety and effectiveness in children have not been established

Hydrochlorothiazide: GENERAL. Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely: Hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids. Medication such as digitalis may also influence serum electrolytes. Warning signs irrespective of cause are: Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting.

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia. Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg, increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content.

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather, appropriate therapy is water restriction, rather than administration of salt, except in rare instances when the hyponatremia is life-threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy

Insulin requirements in diabetic patients may be increased, decreased, or unchanged. Diabetes mellitus which has been latent may become manifest during thiazide administration.

If progressive renal impairment becomes evident, consider withholding or discontinuing diuretic therapy

Thiazides may decrease serum PBI levels without signs of thyroid disturbance.

Calcium excretion is decreased by thiazides. Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy. The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration, have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function.

DRUG INTERACTIONS. Thiazide drugs may increase the responsiveness to tubocurarine

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient. Thiazides may decrease arterial responsiveness to norepinephrine. This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use.

PREGNANCY: Pregnancy Category C. Thiazides cross the placental barrier and appear in cord blood. The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus. These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

NURSING MOTHERS. Thiazides appear in human milk. If use of the drug is deemed essential, the patient should stop nursing.

PEDIATRIC USE: Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy.

Cardiovascular: Bradycardia, congestive heart failure; intensification of AV block, hypotension; paresthesia of hands; thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type

Central Nervous System: Lightheadedness; mental depression manifested by insomnia, lassitude, weakness, fatigue; reversible mental depression progressing to catatonia; visual disturbances; hallucinations, an acute reversible syndrome characterized by disorientation for time and place; short-term memory loss; emotional lability; slightly clouded sensorium; and decreased performance on neuropsychometrics

Gastrointestinal: Nausea, vomiting, epigastric distress, abdominal cramping, diarrhea, constipation; mesenteric arterial thrombosis, ischemic colitis.

Allergic: Pharyngitis and agranulocytosis, erythematous rash; fever combined with aching and sore throat, laryngospasm and respiratory distress.

Respiratory: Bronchospasm

Hematologic: Agranulocytosis; nonthrombocytopenic purpura, thrombocytopenic purpura.

Auto-Immune: In extremely rare instances, systemic lupus erythematosus has been reported.

Miscellaneous. Alopecia; LE-like reactions, psoriasiform rashes, dry eyes; male impotence; and Peyronie's disease have been reported rarely. Oculomucocutaneous reactions involving the skin, serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol.

Hydrochlorothiazide:

Gastrointestinal: Anorexia, gastric irritation, nausea, vomiting, cramping, diarrhea, constipation; jaundice (intrahepatic cholestatic jaundice); pancreatitis; sialadenitis.

Central Nervous System. Dizziness, vertigo; paresthesias; headache; xanthopsia.

Hematologic: Leukopenia, agranulocytosis; thrombocytopenia, aplastic anemia.

Cardiovascular: Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).

Hypersensitivity: Purpura, photosensitivity, rash; urticaria, necrotizing angiitis (vasculitis, cutaneous vasculitis); fever, respiratory distress, including pneumonitis; anaphylactic reactions.

Other. Hyperglycemia, glycosuria; hyperuricemia, muscle spasm; weakness, restlessness; transient blurred vision.

Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

*The appearance of these capsules is a registered trademark of Ayerst Laboratories

REFERENCES

1. Data on file, Ayerst Laboratories. **2.** Ravid M, Lang R, Jutrin I. The relative antihypertensive potency of propranolol, oxprenolol, atenolol, and metoprolol given once daily. *Arch Intern Med* 1985;145:1321-1323. **3.** Sumiye L, Vivian AS, Frisof KB, et al: Potassium loss associated with hydrochlorothiazide versus chlorthalidone. *Clin Ther* 1981;4:308-320. **4.** Ram CVS, Garrett BN, Kaplan NM: Moderate sodium restriction and various diuretics in the treatment of hypertension. *Arch Intern Med* 1981;141:1015-1019

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Minnesota Physician's Directory

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

MAY, 1986

14-15 **Human Aging IX: Health Maintenance and Wellness** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455. 612/373-8012.

15 **Changing Profiles in Clinical Toxicology.** St. Paul-Ramsey Medical Center, Hennepin County Medical Center, Minneapolis. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

17 **The Menopausal Woman** Park Nicollet Medical Foundation, Naegele Auditorium, Park Nicollet Medical Center. CONTACT: Elaine Anderson, Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota 55416. 612/927-3703.

20 **Symposium on Gynecologic Oncology** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21-23 **Current Concepts in Radiation Therapy** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

22 **Smoke-Free Hospital Workshop** Minnesota Coalition for a Smoke-Free Society 2000, Moorhead, Minnesota. CONTACT: Judy Knapp, Project Coordinator, University of Minnesota, 611 Beacon Street SE, Minneapolis, Minnesota 55455. 612/625-5436.

27 **Pediatric Infectious Disease: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis. CONTACT: Darleen Papin, 2525 Chicago Avenue South, Minneapolis, Minnesota 55404. 612/874-6194.

30-31 **Symposium on Gay & Lesbian Adolescents** CME, Medical School, University of Minnesota. Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

JUNE, 1986

2-3 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414. 612/376-7520.

4 **Option in Cardiovascular Medicine** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-7 **15th Annual Workshops on Clinical Hypnosis-Introductory & Advanced** CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

6-8 **Surgery for Primary Care** CME, Medical School, University of Minnesota, Craguns Resort, Brainerd, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

13-14 **Hospital Nutrition Support** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 2023 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

13-15 **Minnesota Thoracic Society Annual Scientific Meeting** Minnesota Thoracic Society, Madden's Resort, Brainerd, Minnesota. CONTACT: Scott F. Davies, M.D, Department of Medicine, Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, Minnesota 55413. 612/347-2705.

18-21 **50th Annual Surgery Course: Trauma & Critical Care Surgery** CME, Medical School, University of Minnesota, Willey Hall and Amfac Hotal, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21 **Minnesota Obstetrical and Gynecological Society Spring Meeting 1986** Minnesota Obstetrical and Gynecological Society, St. James Hotel, Red Wing, Minnesota. CONTACT: T. M. Julian, M.D., Box 395 Mayo Building, Minneapolis, Minnesota 55455. 612/373-4043.

23-24 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414. 612/376-7520.

25-27 **Topics and Advances in Pediatrics** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

JULY, 1986

7-9 **Orthopaedic Surgery: Shoulder** CME, Medical School, University of Minnesota, Hyatt Regency Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455. 612/373-8012.

11-12 **Ophthalmic Reviews** Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55095. 507/284-2085.

17-20 Multidisciplinary Conference on Cardiovascular Disease: Patient Problems Abbott Northwestern Hospital, Grand View Lodge on Gull Lake, Brainerd, Minnesota. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

21-22 Treatment of Families in Sexual Crisis Series; Program in Human Sexuality Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414. 612/376-7520.

24-25 Symposium on Nuclear Medicine CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455. 612/373-8012.

July 31-August 2 Third Annual St. Paul-Ramsey Trauma Conference St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, Wisconsin. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

SEPTEMBER, 1986

5-6 Medical Directors CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

8-12 49th Annual Radiology Course Gastrointestinal and Abdominal Intervential Radiology; CME, Medical School, University of Minnesota, Willey Hall/AMFAC Hotel, 225 19th Avenue SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

19 Pediatric Update St. Paul-Ramsey Medical Center, St. Paul Hotel, 350 Market Street, St. Paul, Minnesota 55102. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

26-27 Adolescent Medicine Conference: High Risk Youth CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

OCTOBER, 1986

1-3 Annual Internal Medicine Review CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

3 Chemical Exposures: Emergency Response & Management St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, Minnesota 55101. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

8-11 Principles of Colon and Rectal Surgery CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

15-18 The 20th Annual Orthopaedic and Trauma Seminar Hennepin County Medical Center, Hennepin County Medical Center, Pillsbury Auditorium, 701 Park Avenue South, Minneapolis, Minnesota 55415. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office - 813, 701 Park Avenue South, Minneapolis, Minnesota 55415. 612/347-2812.

17 Geriatric Medicine-Cardiology CME, Medical School, University of Minnesota; Pillsbury Auditorium; Hennepin County Medical Center; 701 Park Avenue; Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

18-19 Update in Cardiology, Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

20-22 Clinical Reviews Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

22-24 Obstetrics and Gynecology Annual Autumn Seminar CME, Medical School, University of Minnesota, Amfac Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE;, Minneapolis, Minnesota 55455. 612/373-8012.

24 E.T. Bell Pathology Symposium CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

CORRECTIONS

Minnesota Medicine 69:140-141, March 1986

Members of the MMA Task Force on AIDS appreciate the illustrations which were provided courtesy of Robert Bowman, M.D., and Michael Chopek, M.D., American Red Cross Blood Services, St. Paul Division.

Minnesota Medicine 69:211, April 1986

The member listing of the MMA Task Force on AIDS should have included: Hanan Rosenstein, M.D., Minneapolis; Margaret Simpson, M.D., Minneapolis; Valentine O'Malley, M.D., Minneapolis (ex-officio)

THE SURGEON GENERAL INVITES YOU TO JOIN AN ELITE CORPS OF PHYSICIANS TWO DAYS A MONTH.

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Upon approval of your application, you will be commissioned as an officer in the United States Army Reserve.

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J-6138 January 1986

"High blood pressure should be a red flag to screen for cholesterol..."[1]

290
270
250
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90
70
50

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If your patients have hypertension, they probably have high cholesterol too.

The Framingham Heart Study[2] showed that over two thirds of the 35 and older population in that study with systolic blood pressures over 145 mmHg also had serum cholesterol levels of 225 mg/dL or more, and 46% had levels above 250 mg/dL.

While many clinical laboratories still report 250 mg/dL as "normal" cholesterol, the NIH Consensus Development Conference Statement on Cholesterol and Heart Disease[3] stated that any level above 220 mg/dL is associated with a significantly increased risk of coronary heart disease.

You need to know, because high cholesterol parallels high blood pressure as a CHD risk factor.

Epidemiological studies and large-scale prevention trials have indicated that as with blood pressure, serum cholesterol levels are proportionately related to CHD risk. Specifically, *"...for every 10 mmHg rise in pressure, there appears to be about a 30% rise in cardiovascular risk."*[4] *"...for every one percent you go up the American cholesterol scale, your subsequent rate of heart attack rises two to three percent."*[5]

And although the specific impact on CHD has not been determined, we know that many of the principal agents used to lower blood pressure actually increase cholesterol.

Wytensin® lowers blood pressure effectively without raising cholesterol.

While Wytensin is not a cholesterol-lowering agent and is not indicated for the treatment of hyperlipidemia, in controlled clinical trials[6] it caused a slight, sustained decrease in total cholesterol without reducing the HDL fraction or altering serum triglycerides.

At the same time, Wytensin lowered blood pressure as effectively as hydrochlorothiazide, propranolol, clonidine or methyldopa. Drowsiness and/or dry mouth, the most frequent side effects noted with Wytensin, usually diminish or disappear over time. In fact, in double-blind studies to date, discontinuance of therapy for all side effects occurred in about 13% of patients.

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(guanabenz acetate)

Antihypertensive therapy that does not increase cholesterol

See important information on following page.

References: 1. Glueck CJ: Remarks in the symposium, *Blood Pressure, Cholesterol and Coronary Heart Disease,* Washington, D.C., March 31, 1985. 2. *The Framingham Study, An epidemiological investigation of cardiovascular disease,* Section 28, U.S. Dept. of Health, Education, and Welfare. 3. National Institutes of Health Consensus Development Conference Statement, 1984: Vol 5, No 7, p 4. 4. Chobanian AV: The influence of hypertension and other hemodynamic factors in atherogenesis. *Progress in Cardiovascular Diseases, XXVI* (3): 177, Nov/Dec, 1983. 5. Castelli WP: Remarks in the symposium, *Blood Pressure, Cholesterol and Coronary Heart Disease,* Washington, D.C., March 31, 1985. 6. Data on file, Wyeth Laboratories.

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WyTensin®
(guanabenz acetate)

Antihypertensive therapy that does not increase cholesterol

Brief Summary

Before prescribing, consult the complete package circular.

Indications and Usage: Treatment of hypertension, alone or in combination with a thiazide diuretic.

Contraindication: Known sensitivity to the drug.

Precautions: 1. Sedation. Causes sedation or drowsiness in a large fraction of patients. When used with centrally active depressants, e.g., phenothiazines, barbiturates and benzodiazepines, consider potential for additive sedative effects. 2. Patients with vascular insufficiency. Like other antihypertensives use with caution in severe coronary insufficiency, recent myocardial infarction, cerebrovascular disease, or severe hepatic or renal failure. 3. Rebound. Sudden cessation of therapy with central alpha agonists like **Wytensin** may rarely result in "overshoot" hypertension and more commonly produces increase in serum catecholamines and subjective symptomatology.

INFORMATION FOR PATIENTS: Advise patients on **Wytensin** to exercise caution when operating dangerous machinery or motor vehicles until it is determined they do not become drowsy or dizzy. Warn patients that tolerance for alcohol and other CNS depressants may be diminished. Advise patients not to discontinue therapy abruptly.

LAB TESTS: In clinical trials, no clinically significant lab test abnormalities were identified during acute or chronic therapy. Tests included CBC, urinalysis, electrolytes, SGOT, bilirubin, alkaline phosphatase, uric acid, BUN, creatinine, glucose, calcium, phosphorus, total protein, and Coombs' test. During long-term use there was small decrease in serum cholesterol and total triglycerides without change in high-density lipoprotein fraction. In rare instances occasional nonprogressive increase in liver enzymes was observed, but no clinical evidence of hepatic disease.

DRUG INTERACTIONS: **Wytensin** was not demonstrated to cause drug interactions when given with other drugs, e.g., digitalis, diuretics, analgesics, anxiolytics, and antiinflammatory or antiinfective agents, in clinical trials. However, potential for increased sedation when given concomitantly with CNS depressants should be noted.

DRUG/LAB TEST INTERACTIONS: No lab test abnormalities were identified with **Wytensin** use.

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY: No evidence of carcinogenic potential emerged in rats during a two-year oral study with **Wytensin** at up to 9.5 mg/kg/day, i.e., about 10 times maximum recommended human dose. In the Salmonella microsome mutagenicity (Ames) test system, **Wytensin** at 200-500 mcg per plate or at 30-50 mcg/ml in suspension gave dose-related increases in number of mutants in one (TA 1537) of five *Salmonella typhimurium* strains with or without inclusion of rat liver microsomes. No mutagenic activity was seen at doses up to those which inhibit growth in the eukaryotic microorganism, *Schizosaccharomyces pombe*, or in Chinese hamster ovary cells at doses up to those lethal to the cells in culture. In another eukaryotic system, *Saccharomyces cerevisiae*, **Wytensin** produced no activity in an assay measuring induction of repairable DNA damage. Reproductive studies showed a decreased pregnancy rate in rats given high oral doses (9.6 mg/kg), suggesting impairment of fertility. Fertility of treated males (9.6 mg/kg) may also have been affected, as suggested by decreased pregnancy rate of mates, even though females received drug only during last third of pregnancy.

PREGNANCY: Pregnancy Category C. WYTENSIN® MAY HAVE ADVERSE EFFECTS ON FETUS WHEN ADMINISTERED TO PREGNANT WOMEN. A teratology study in mice indicated possible increase in skeletal abnormalities when **Wytensin** is given orally at doses 3 to 6 times maximum recommended human dose of 1.0 mg/kg. These abnormalities, principally costal and vertebral, were not noted in similar studies in rats and rabbits. However, increased fetal loss has been observed after oral **Wytensin** given to pregnant rats (14 mg/kg) and rabbits (20 mg/kg). Reproductive studies in rats have shown slightly decreased live-birth indices, decreased fetal survival rate, and decreased pup body weight at oral doses of 6.4 and 9.6 mg/kg. There are no adequate, well-controlled studies in pregnant women. **Wytensin** should be used during pregnancy only if potential benefit justifies potential risk to fetus.

NURSING MOTHERS: Because no information is available on **Wytensin** excretion in human milk, it should not be given to nursing mothers.

PEDIATRIC USE: Safety and effectiveness in children less than 12 years of age have not been demonstrated; use in this age group cannot be recommended.

Adverse Reactions: Incidence of adverse effects was ascertained from controlled clinical studies in U.S. and is based on data from 859 patients on **Wytensin** for up to 3 years. There is some evidence that side effects are dose-related. Following table shows incidence of adverse effects in at least 5% of patients in study comparing **Wytensin** to placebo, at starting dose of 8 mg b.i.d.

Adverse Effect	Placebo (%) n = 102	**Wytensin** (%) n = 109
Dry mouth	7	28
Drowsiness or sedation	12	39
Dizziness	7	17
Weakness	7	10
Headache	6	5

In other controlled clinical trials at starting dose of 16 mg/day in 476 patients, incidence of dry mouth was slightly higher (38%) and dizziness was slightly lower (12%), but incidence of most frequent adverse effects was similar to placebo-controlled trial. Although these side effects were not serious, they led to discontinuation of treatment about 15% of the time. In more recent studies using an initial dose of 8 mg/day in 274 patients, incidence of drowsiness or sedation was lower, about 20%. Other adverse effects reported during clinical trials but not clearly distinguishable from placebo effects and occurring with frequency of 3% or less: Cardiovascular—chest pain, edema, arrhythmias, palpitations. Gastrointestinal—nausea, epigastric pain, diarrhea, vomiting, constipation, abdominal discomfort. Central nervous system—anxiety, ataxia, depression, sleep disturbances. ENT disorders—nasal congestion. Eye disorders—blurring of vision. Musculoskeletal—aches in extremities, muscle aches. Respiratory—dyspnea. Dermatologic—rash, pruritus. Urogenital—urinary frequency, disturbances of sexual function. Other—gynecomastia, taste disorders.

Drug Abuse and Dependence: No dependence or abuse has been reported.

Overdosage: Accidental ingestion caused hypotension, somnolence, lethargy, irritability, miosis, and bradycardia in two children aged one and three years. Gastric lavage and pressor substances, fluids, and oral activated charcoal resulted in complete and uneventful recovery within 12 hours in both. Since experience with accidental overdosage is limited, suggested treatment is mainly supportive while drug is being eliminated and until patient is no longer symptomatic. Vital signs and fluid balance should be carefully monitored. Adequate airway should be maintained and, if indicated, assisted respiration instituted. No data are available on **Wytensin** dialyzability.

Dosage and Administration: Individualize dosage. A starting dose of 4 mg b.i.d. is recommended, whether used alone or with a thiazide diuretic. Dosage may be increased in increments of 4 to 8 mg/day every one to two weeks, depending on response. Maximum dose studied has been 32 mg b.i.d., but doses this high are rarely needed.

How Supplied: (guanabenz acetate) Tablets, 4 mg, bottles of 100 and 500; 8 mg and 16 mg, bottles of 100.

Revised 2/14/85

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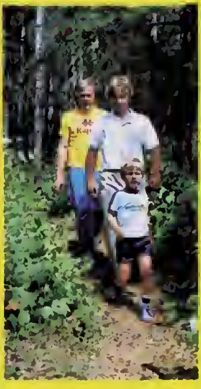

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Family Practice Opportunity in N.E. South Dakota. Modern 35-bed hospital with clinic nearby. Two board certified family practitioners in community. Excellent family practice opportunity. Contact: Kevin L. Bjordahl, M.D., Day County Medical Center, Box 90, Webster, South Dakota 57274; (605) 345-3396. 1-5/86

Family Practice and Internal Medicine positions available at the Faribault Clinic. The clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000, located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 N.E. First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

Physicians: Ready for a change? Positions nationwide. BE/BC. NO FEE! 15 years recruiting experience. Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014; (612) 786-1929. 1-5/86.

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Physician Preceptor in Family Practice. Upper Peninsula Health Education Corporation is accepting applications for a full-time family physician in a unique, rural medical education center. Responsibilities are patient care including obstetrics and clinical instruction of medical students of the Upper Peninsula campus of Michigan State University's College of Human Medicine. Requirements are board eligibility or certification in family practice with a commitment to medical education. Salary and rank commensurate with experience. Send inquiries to John Hickner, M.D., Bay de Noc Family Health Center, Doctors Park, Escanaba, Michigan 49829; (906) 786-9510. 1-5/86

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Wanted: Family Practitioner - OB/GYN. Group practice, central Minnesota. Starting salary $55,000. Write Minnesota Medicine (755), 2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414. (R)

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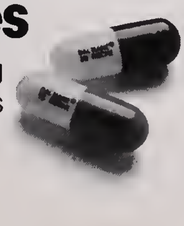

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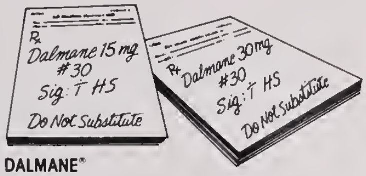

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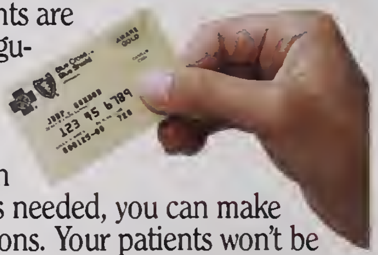

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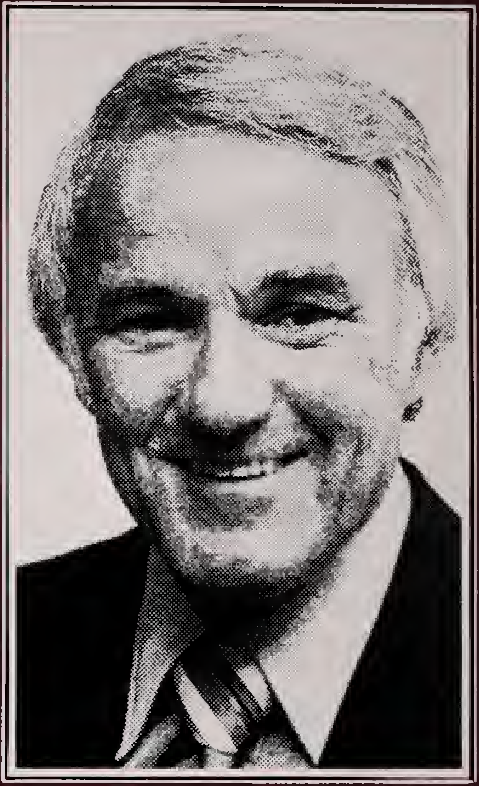

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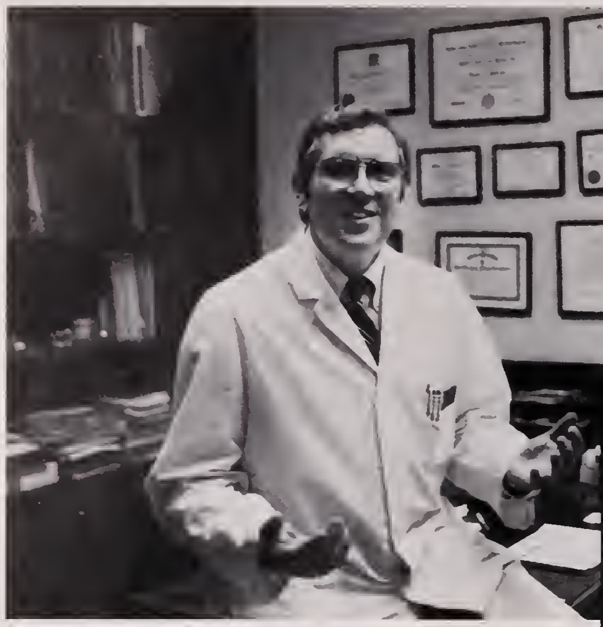

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President's Letter

MMA: Where We've Been Where We're Going

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

It's been eleven years since I missed a Clay-Becker County Medical Meeting and, by default, became the Trustee from Northwestern Minnesota. On May 1, 1986 I became your President. This seems an appropriate opportunity for some review and projections.

In the past decade, much has happened to position the MMA as a moving force in Minnesota health care.

We have seen our total membership grow proportionately to the increased licensing of M.D.s in Minnesota. The MMA reorganized itself internally to better deal with the socio-economic external forces buffeting medicine. This included a changeover of management from those who served us well for so many years to those who have brought the MMA the benefits of vigorous youth and the skills with which to confront today's complex health care questions.

The MMA has confronted these questions with significant studies and reports on the cost of health care, manpower, competition, medical education financing, data collection and the professional liability commission.

We have effectively monitored and responded to organizations dealing with specific aspects of health care such as peer review at the Foundation for Health Care Evaluation; health care costs at the Minnesota Coalition on Health Care Costs; services utilization at the Health Systems Agencies; Medicaid at the Department of Human Services; and public health at the Minnesota Department of Health.

The MMA, through its extremely capable legislative representatives, has successfully supported positive legislation and defeated many examples of legislation which would have adversely affected the high quality of health care enjoyed by citizens of Minnesota. That we've less successfully dealt with the question of reimbursement is not for lack of trying.

The MMA has a high dues structure because it is an organization dedicated to promoting the public health of citizens in Minnesota and the coexistent needs of our members as they provide the best health care possible. These promotions are expensive because they are person-power intensive. Many of our M.D.s have enjoyed the reputation for working long and arduous hours for their patients. After eleven years, I can accurately say that I've never known an M.D. who works longer or harder at their job than do most of our MMA staff.

Recognizing that dues can't be raised ad infinitum, the MMA developed the Minnesota Medical Services Corporation (MMSC) three years ago. This is the for-profit arm providing high quality products and services to our members for two basic purposes: to assist our members in their increasingly competitive medical practice situations and to earn significant non-dues dollars for the MMA.

The MMSC is ahead of projections in meeting these goals. One-third of the MMA's total revenue now comes from non-dues sources.

We have also participated in the building of the Health Associations Center and shared in the benefits of this structure. Our financing and guidance led to the formation of the Minnesota Medical Insurance Exchange, a physician-owned professional liability company. Its positive impact on premiums and process long ago returned our investment.

The MMA has gradually asserted itself at the AMA through people like Drs. Bob Kelly and Bill Jacott, who have successfully served on AMA councils and the Board of Trustees. The Minnesota

AMA delegation has disproportionately affected AMA policy in many positive ways, most specifically in the AMA statements on smoking, athletic protection, health planning, peer review and reimbursement for services. The Minnesota AMA delegation has played an important role in the revitalization of the North Central Medical Conference as a potent influence at the AMA.

But where are medicine and the MMA going in the next decade?

In my opinion, we are in a critical transition period. Medicine's ability to deliver services and the public's willingness to absorb these services has far outstripped the ability, or at least the will, to pay for these services. This has resulted in the "more-and-more for less-and-less syndrome." Medicine is beginning to deal with this by developing cost-consciousness, alternative health care delivery systems, public education and debate and horizontal/vertical integration with corporatization at all levels.

It's likely that the more-and-more for less-and-less will stay with us for the decade. Medicine and the MMA must find ways to deal with this conundrum. We have three choices.

We can continue to lobby for more money for the system, and we probably will, but with limited success.

We can go along with a rationing process that will find M.D.s in the position of denying services to designated groups or persons—we are close to this now.

We can take the lead in developing a cost-effective and cost beneficial system that is internally rather than externally controlled, that responds to needs more than wants. This system will address the considerable inefficiencies and negatives that presently exist. It will continue to move us from the cottage to the board room. It will be an exciting decade.

The MMA has an important role to play in this development and is gearing up for this by the adoption of its Third Biennium Long Range Plan 1988 and Beyond.

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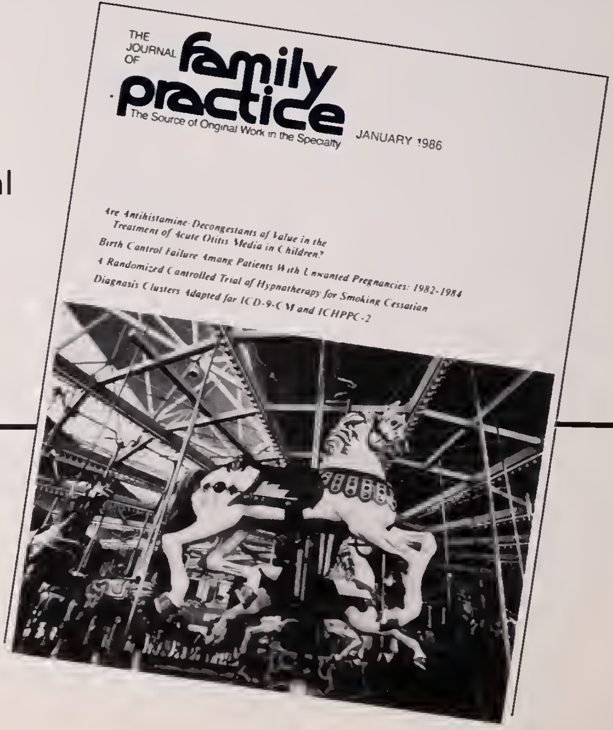
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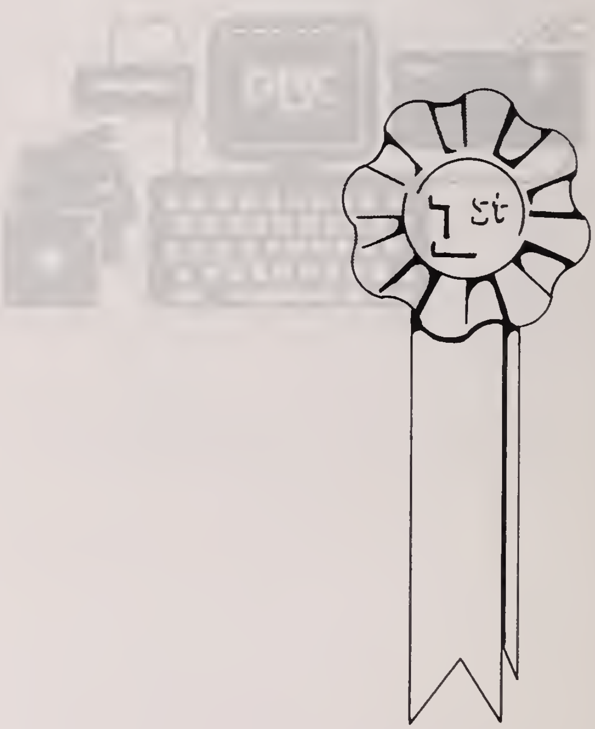

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Editor's Notebook

The Corporate Transformation of Medicine in Minnesota: A Talk in the Park.

An Interview with Doctor Glen Nelson, Chief Executive Officer of American MedCenters, Inc.

Nineteenth in a Series

St. Louis Park—Each time I visit the seven story Park Nicollet Medical Building, near where Highway 100 and Excelsior Boulevard cross, I get an edifice complex. As medical clinic buildings go, this handsome brick building looms high. Its very size says something—that the structure of medicine has changed—permanently.

Bricks and Mortals

Such a building reminds me how far the complex structure of corporate medicine has come. You need corporate bricks—capital, buildings, management skills—to compete. But even given these bricks, foundations can get unstable in a competitive environment. Brick walls do not protect an organization against external turbulence or internal turmoil.

- It is no secret Park Nicollet is caught in the jaws of grinding forces that are moving it toward consolidation with other organizations. The market is demanding that organizations offer triple options (HMO, a PPO, and an indemnification product), that they set up a wide network of physicians to make Freedom of Choice a reality, and that they put in computer and manager systems integrating product options and physician networks.

- It is no secret American MedCenters has negotiated with, or at least talked to, organizations pursuing national strategies, such as Hospital Corporation of America and Voluntary Hospitals of America/Aetna.

- And it is no secret that the juxtaposition and inter-relationship of the Park Nicollet Clinic, the largest multispecialty group in the Twin Cities, with MedCenters Health Plan, the second largest HMO in the Twin Cities (with enrollment of 224,698 compared to PHP-SHARE at 473,484), and with American MedCenters, a for-profit holding company seeking national expansion, have created awkward organizational questions for MedCenters.

Organizational Questions

How can you expand nationally when part of your capital must come from your local plan? How can you raise capital from the public market if Minnesota forbids for-profit HMOs? How can you run a homogenous, coordinated and quality multispecialty model when your environment clamors for more outlets, more doctors and more products? And can you do all these things when your leaders, your systems and your philosophies came out of simpler times—when you regarded yourself as an oasis of physician tranquility and medical excellence?

Dealing with Dilemmas

Dealing with these dilemmas has been the job of Glen Nelson, M.D. Glen is Chief Executive Officer of American MedCenters and until recently was also Chairman and President of the Park Nicollet Medical Center.

Glen is a tall, slender, physically fit man, with clear green eyes and a quiet demeanor. He projects a reserved confidence, speaks easily, has a touch of sadness about him and tends to speak in abstract terms about what makes for an efficient, cost effective and compassionate health care delivery system.

This interview took place in his quiet corner office on the seventh floor of a new section of the Park Nicollet Office Building.

REECE: Dr. Nelson, this is my third interview with Chief Executives of HMOs. Each HMO has a distinctive character and each chief executive has his own style. You're the first chief executive officer I've interviewed who is also an M.D.

What are the particular characteristics of your organization? And how does being a physician influence your view of the world?

NELSON: MedCenters and American MedCenters differ because we focus on delivering health care rather than on the indemnification aspect of providing totally managed health care. That I'm a physician tells you where the company's origins are and that the origins are in the medical group practice. Even forming American MedCenters as a public company was for different reasons than the forming of the other companies.

One of the principal reasons for forming American MedCenters was to create a mechanism to provide capital for the medical delivery portion of the integrated product. The three parts of that product are indemnification, physician services and patient services. At any rate, we recognized that capitalizing the health providers was the way to deliver better quality health care and to be successful in the long term.

We strongly believe that with our related organizations we can provide a better quality of health care, be economically more efficient, and stand the test in the marketplace—all at the same time.

Some of today's marketplace struggles are between choice and price. These struggles will diminish in their impact as the purchaser, whether that be an employer or an individual, comes to focus on health outcomes. Then it's going to be important to demonstrate that your health outcomes are better. The ability to demonstrate a better outcome, we believe, is more readily done if you have a controlled system of delivery, where you can incorporate all the information necessary to manage care.

There's a lot of talk about information systems and quality assurance systems and different degrees of sophistication of information systems. And rightly so. The capital raised when American MedCenters went public was in the neighborhood of nine million dollars. Three million dollars of that were assigned to acquiring new computer hardware and software. These are tools to assess real health outcomes, in economic terms and in human terms. We need information systems to assess issues like: How long was someone actually disabled? When did he return to work? Was he a productive employee after he returned?

We want to know not only how much it costs to have a hernia repair, but also how long that employee is lost as a member of the work force. Oftentimes those costs are higher than the costs of actual intervention.

REECE: So you're concerned about short-term quality and long-term productivity of the patient as well?

NELSON: Yes.

REECE: Your model is the multispecialty clinic model. Part of your plans to expand nationally must entail bringing other multispecialty clinics into the fold. Do you stress the physician culture when you approach acquisition?

NELSON: Very much. We view ourselves as an extension of the physician. Physicians should help manage the health care system rather than relying on a third party. We believe the multispecialty group model is a good core for a delivery system.

A group practice can serve as a nucleus for normal patterns and relationships with other physicians. You need a network of physicians so you have the capability of providing a reasonable amount of choice within a controlled and managed system.

That's part of what you've seen evolve in the Twin Cities. Park Nicollet was the core medical group. It in turn has related itself to other medical groups and even individual physician practices in a coherent and organized network fashion. The core can establish templates to measure outcome and to suggest protocols for treatment.

REECE: You were quoted in the April *Minneapolis/St. Paul Magazine* as saying . . ."Our industry is in a time of consolidation and things are getting more capital intensive so you had better pick your partners early."

In the last three or four years you've expanded from your core 260 physicians by affiliating 440 other physicians. The grand total is now 700. You have indeed picked your partners early. Does that quote mirror your philosophy?

NELSON: Yes, and on a regional and national scale, too. We'll be seeing more consolidation, rather than less. We're going to see hospital consolidation very quickly and there will also be consolidation between some of the hospitals and physician practices.

My remark relates to this rapid consolidation. It seems to us that the strategic thing to do is to determine what the best fits might be, to construct those at a time when the options are still open, and to do so when you can look at all the options.

And if you extend that then to a larger framework, you have the components necessary to appropriately deliver health care if you can bring them together. So you must examine who the right people are and be ready to put them together.

REECE: Which leads to the next question. How do you envision the American MedCenters national network? Would that be a group of multispecialty clinics from coast to coast?

NELSON: When we formed the company and described our strategies in our offering, we described the plan. We did focus on large multispecialty group practices around the country. That is still a key component of our strategy. An example is our joint venture with the Virginia-Mason Clinic to form an HMO in Seattle which is now operative.

One thing that we've learned is that the ability of these larger groups to network with other physicians. We still believe in the importance of having a core medical group. We still see it as our niche in the market.

We believe the model can be modified. Opportunities exist to organize medical staff in certain hospitals to function like a group practice and become a core for a network.

But you must be selective. Belonging to large groups will not be for all physicians. Given the speed with which the society has accepted organized groups, one does not always have enough time to organize enough multispecialty group practices quickly enough to serve the public. So you try to incorporate the best aspects of multispecialty group practice in a looser network and to move to increase the panel of prepaid patients. In effect you create a larger group.

REECE: Your entry into the Twin Cities' HMO market in 1972 when the St. Louis Park Clinic formed MedCenters Health Plan is widely regarded as the catalytic event that led to the current cascading HMO growth.

Do you accept that theory? Do you see respected multispecialty clinics in the rest of the country following suit and forming HMOs? Will these types of HMOs be important regional competing organizations?

NELSON: It would have happened somewhere else had we not done it. Now there are sufficient catalysts in the mixture to ensure the evolution of a new health care system.

It's going to occur throughout the country. In California, just the presence of the Kaiser system would have caused this industry to evolve there.

Certainly, though, the Twin Cities have become an example of where similar demographic markets will grow. They seem to grow faster elsewhere than the Twin Cities once they start.

REECE: Ellwood and Burke say the tough regulatory climate in Minnesota impedes the HMO industry. We're one of the two states forbidding for-profit HMOs. Do you think that law has retarded the growth of a national HMO center here? If these regulations were removed, would it be a good thing?

NELSON: The regulatory situation has inhibited opportunity for Minnesota companies to use their advanced state of development to become national firms. That affect is now water over the dam because other national firms have been able to move more aggressively. The valuation of the Minnesota firms would increase if they were better able to capitalize themselves to aggressively compete nationally.

That the regulatory structure can retard our ability to move fast decreases our profitability and substantially reduces the value in other marketplaces. So it has dampened the opportunity to grow a new industry based here in Minnesota.

REECE: Ellwood is also saying that if we didn't have this dampening effect, we could become the so-called Silicon Valley of health care. And as a bonus, for-profit firms would bring in tax revenues for the state.

NELSON: The second part of your question was whether removing regulations would increase our growth. The answer is yes. But the early advantages have been lost already. While the local HMOs were restricted, others were less restricted. But yes, we would be better able to compete if the regulatory situation changes.

REECE: What is MedCenters Health Plan's current competitive position in the Twin Cities market? It's my perception it's a difficult time for you because of your capital demands and of your need to bring your computer systems and other management system up to speed to cope with the new environment.

NELSON: Well, we had the best enrollment growth in history in the first quarter of 1986. And our operation in the Twin Cities is very profitable. American MedCenters as a company is most tested by development costs in new markets and in the administrative demands placed by the multiplicity of new products, from just an operating standpoint.

But economically in the Twin Cities market, MedCenters is really faring very well. There is genuine price reduction brought on by competition. Anyone who even thinks for a minute that the HMO industry hasn't reduced health care costs in this area has missed the true impact. Much of the HMO savings to date has been in terms of the individual out of pocket experience with non-covered health care expenses and also reduced inflation of health care costs.

The largest savings went to the individual rather than the employers intially. I don't see that as a bad result. There is some perception that employers haven't had the windfall they would have expected due to the change in practice patterns. Compared to the rest of the country, employers have done well here.

REECE: Would you elaborate on the last point?

NELSON: In the Twin Cities, we have a flat growth rate of the total population but an increasing aging population. In an actuarial sense you would expect escalating health care costs. Our inflationary rate for health care costs in Twin Cities is growing less rapidly than the rest of the country. This includes places like San Diego where the population is younger and growing.

So I think in an actuarial sense, you would predict that health care costs would go up faster in the northern tier of states where the populations are aging.

REECE: So despite the aging population, competing organizations have a moderating effect on health care costs. Certainly our costs are dramatically less than in Boston or Miami.

One thing I have observed about your organization is that you stress patient education heavily, both in your advertising and in your practices. For example, you regularly hold symposiums for patient education. Could you tell us the scope of your patient education efforts?

NELSON: We state, and correctly so, that we have more patient education programs than any other health insurance alternative. These range from the predictable areas like smoking cessation and weight loss and stress management to some real wellness initiatives.

The SHAPE program begun in the middle 70's is just one example of being advanced in the idea that we could educate people to change their personal behavior in a way that would impact their health.

The International Diabetes Center demonstrated to us we could reduce the hospitalization rate of juvenile diabetics through education. Our rate is much lower than in other places.

Patient education is good medicine and good economics. It serves both purposes. Our organization primarily focuses on health outcomes and financial impact.

REECE: Could you tell me how the Diabetes Center evolved and how that is interconnected with the American MedCenters or the Park Nicollet Clinic?

NELSON: When we start talking about American MedCenters, you can't talk just about American MedCenters. You find yourself talking about Park Nicollet Medical Center, Park Nicollet Medical Foundation, and the International Diabetes Center which is an organization that functions within the Medical Foundation. It is a charitable nonprofit organization with a major focus on patient education, although clinical care is part of the program too.

Basically, the program grew out of Dr. Donnell Etzwiler's national recognition as a leading pediatric diabetologist. He found youngsters and their families did much better in dealing with insulin dependent diabetes if they were knowledgeable about the disease and were instructed in self-care.

Now over time the expertise that was developed in that Center has benefited other people around the country. The Center for Disease Control in Atlanta is responsible for diabetes control in about 30 states. They sent their professionals here for a one week curriculum to be educated in the disease and in the care and management and training of their professionals.

And now programs also exist for newly insulin-dependent adults. New diabetics who go on insulin formerly were in the hospital for five days. Now we can start people on an outpatient basis. This not only is cost effective but again the patient controls his own condition to a greater degree.

Our basic philosophy is that patient knowledge and participation promote a better outcome. You're aware of the number of unfilled prescriptions that might be controlling hypertension today. That story is repeated over and over again. Patient compliance and understanding and knowledge are fundamental.

Let me give you other instructive examples. We started examining hospital admission patterns for certain surgical interventions, such as cholecystectomy. We discovered lengths of stay could be substantially reduced by preop education.

Why were patients staying so long? Part of it was their perception of how long they thought they would be in the hospital. After all, their mother was in the hospital for two weeks when she had her gallbladder removed.

To some extent, physicians were trapped into a patient expectation of how long they would be in the hospital. This was true even when on the third day the surgeon knew the patient was ready to go home. To tell the patient to go home was met with resistance.

So we started a program to educate our patients before cholecystectomy surgery as to why the procedure was necessary and how it would be done. We also established an expectation that they could leave the hospital as early as the third day following a cholecystectomy.

Lo and behold things changed dramatically. Now when a surgeon enters the room on the third post-operative day, they find the patient sitting on the edge of his bed with his bag packed, ready and raring to go home.

This is an example of cost effective care with a better medical outcome. A patient in the hospital who doesn't need to be there is exposed not only to infection but to a potential for receiving unneeded intervention.

REECE: I was reading an article in *Health Affairs* by the President of the Blue Cross/ Blue Shield for the United States. He said the three most humanizing things the medical profession could do to improve the quality of health care were 1) to petition to remove the hospital gowns with exposed patients' backsides, 2) to knock on the door before entering the patient's room, and 3) to explain in writing the procedures patients were about to undergo. His point was: you can approach patients intelligently and compassionately and they will respond if they understand. You have touched on the last point, and you achieved positive results.

NELSON: A fourth rule is: don't call a patient by his first name if you're not on a first name basis.

REECE: I know. I wrote an article on that. It told the tale of Mrs. Santa Claus, who fell ill during her annual sleigh ride through the Twin Cities. The title was, "Please Don't Call me Mary."

Could we be quantitative just for a moment? Could you tell me how many physicians are employed by the Center, how many are affiliated, how many outlets you have?

NELSON: We have about 275 full time physicians employed by Park Nicollet. It may be closer to 300 physicians, but some are part time. These physicians are delivering care at 19 sites around the Twin Cities mostly on the west side of the Mississippi River. In addition we have a close relationship with the Coon Rapids Clinic through MedCenters Health Plan.

Also affiliated around the state are now more than 700 physicians including the Duluth Clinic, the Willmar Clinic, Interstate Clinic, the Fargo Clinic, groups of independent groups in St. Paul, the Minnesota Health Network, and a number of smaller independent practices associated with Willmar or Duluth or Red Wing. There are currently in MedCenters plan about 225,000 enrollees in Minnesota. The Fargo Clinic is actually taking care of Minnesota enrollees in addition to North Dakota residents. In addition, MedCenters is managing HMOs with the Virginia-Mason Clinic in Seattle, Atlanta Medical Associates in Atlanta and the several groups in Wisconsin.

REECE: So you're primarily still a regional HMO.

NELSON: Yes.

REECE: I'm going to put you on the spot here. You say the Twin Cities' health care system is in a period of extremely rapid consolidation. How do you see the configuration five years from now? How will the medical landscape look like?

NELSON: Well, one scenario might include two or three competing hospital groupings. The same scenario might include two, three, or four competing indemnification mechanisms. That could be a traditional indemnifying organization like Blue Cross and/or HMOs. The lines of distinction are going to blur. Organizations are all going to offer the same products so they will come to be judged by their products rather than by their origins.

It seems likely that physicians will find themselves aligned to either the indemnification system and/or the hospital system, not necessarily all working for the same store but all affiliated in some way. Some of them may be independent practitioners. There may be some groupings of physicians in subspecialty areas—plastic surgery might be an example—that will sit on the outside. I continue to be optimistic about the role of the physician. The other thing I see in five years is functional measurement of outcome as an indication of quality and performance.

REECE: Do you see that on the Medigryps model as an important measure of inpatient quality?

NELSON: I think the Medigryps system is narrow in its focus on the hospital. To some extent it's untested and to some extent it's theoretical. Nevertheless it is clearly moving the system in the correct direction and it should be supported.

In the optional approach measurements are going to have to be drawn from a data base that combines the physician data base, the hospital data base, the employer data base and the insurer data base.

In the current environment there isn't willingness or maybe technological ability to exchange that information readily.

I think the systems that are evolving are in vertically integrated systems and involve all those components . . . the physicians, the hospitals, the insurers and the employers. All are going to have to draw together to provide that kind of data base so as to measure all those things that you wish to measure to really assure quality.

REECE: So large organizations with a large patient base will be necessary to generate the large numbers needed to make the right large decisions. Economists and businessmen call this phenomenon the "law of large numbers." Do you think medicine will have to obey that same law?

NELSON: Yes.

Richard L Reece MD

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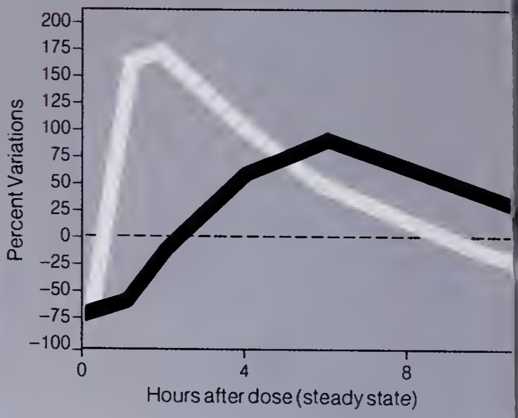

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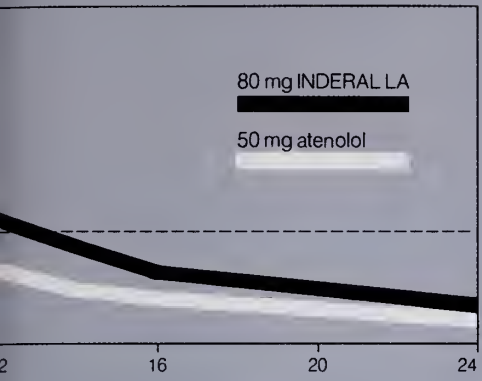

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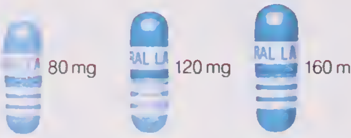

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IN PATIENTS WITH ANGINA PECTORIS, there have been reports of exacerbation of angina and, in some cases, myocardial infarction following *abrupt* discontinuance of propranolol therapy. Therefore, when discontinuance of propranolol is planned the dosage should be gradually reduced and the patient carefully monitored. In addition, when propranolol is prescribed for angina pectoris, the patient should be cautioned against interruption or cessation of therapy without the physician's advice. If propranolol therapy is interrupted and exacerbation of angina occurs, it usually is advisable to reinstitute propranolol therapy and take other measures appropriate for the management of unstable angina pectoris. Since coronary artery disease may be unrecognized, it may be prudent to follow the above advice in patients considered at risk of having occult atherosclerotic heart disease who are given propranolol for other indications.

THYROTOXICOSIS Beta blockade may mask certain clinical signs of hyperthyroidism. Therefore, abrupt withdrawal of propranolol may be followed by an exacerbation of symptoms of hyperthyroidism, including thyroid storm. Propranolol does not distort thyroid function tests.

IN PATIENTS WITH WOLFF-PARKINSON-WHITE SYNDROME, several cases have been reported in which, after propranolol, the tachycardia was replaced by a severe bradycardia requiring a demand pacemaker. In one case this resulted after an initial dose of 5 mg propranolol.

MAJOR SURGERY The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial. It should be noted, however, that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures.

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)—PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS. INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes. In these patients, it may be more difficult to adjust the dosage of insulin. Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure.

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. In patients with impaired renal function, cumulative effects of the drug may develop

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs. Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs.

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported.

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL: Propranolol should be used with caution in patients with impaired hepatic or renal function. Propranolol is not indicated for the treatment of hypertensive emergencies.

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure. Patients should be told that propranolol may interfere with the glaucoma screening test. Withdrawal may lead to a return of increased intraocular pressure

CLINICAL LABORATORY TESTS: Elevated blood urea levels in patients with severe heart disease, elevated serum transaminase, alkaline phosphatase, lactate dehydrogenase.

DRUG INTERACTIONS Patients receiving catecholamine-depleting drugs, such as reserpine should be closely observed if propranolol is administered. The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity, which may result in hypotension, marked bradycardia, vertigo, syncopal attacks, or orthostatic hypotension

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY. Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential. In 18-month studies, in both rats and mice employing doses up to 150 mg/kg/day, there was no evidence of significant drug-induced toxicity. There were no drug-related tumorigenic effects at any of the dosage levels. Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY Pregnancy Category C. Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose. There are no adequate and well-controlled studies in pregnant women. Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus

NURSING MOTHERS: Propranolol is excreted in human milk. Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE: Safety and effectiveness in children have not been established

Hydrochlorothiazide: GENERAL Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals.

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely Hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids. Medication such as digitalis may also influence serum electrolytes. Warning signs irrespective of cause are Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia. Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg, increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content.

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather, appropriate therapy is water restriction, rather than administration of salt, except in rare instances when the hyponatremia is life-threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy

Insulin requirements in diabetic patients may be increased, decreased, or unchanged. Diabetes mellitus which has been latent may become manifest during thiazide administration

If progressive renal impairment becomes evident, consider withholding or discontinuing diuretic therapy

Thiazides may decrease serum PBI levels without signs of thyroid disturbance.

Calcium excretion is decreased by thiazides. Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy. The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration, have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function.

DRUG INTERACTIONS Thiazide drugs may increase the responsiveness to tubocurarine

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient. Thiazides may decrease arterial responsiveness to norepinephrine. This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use.

PREGNANCY Pregnancy Category C. Thiazides cross the placental barrier and appear in cord blood. The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus. These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult.

NURSING MOTHERS Thiazides appear in human milk. If use of the drug is deemed essential, the patient should stop nursing.

PEDIATRIC USE Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy.

Cardiovascular Bradycardia, congestive heart failure, intensification of AV block, hypotension, paresthesia of hands; thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type

Central Nervous System: Lightheadedness, mental depression manifested by insomnia, lassitude, weakness, fatigue; reversible mental depression progressing to catatonia, visual disturbances; hallucinations; an acute reversible syndrome characterized by disorientation for time and place; short-term memory loss; emotional lability; slightly clouded sensorium; and decreased performance on neuropsychometrics.

Gastrointestinal: Nausea, vomiting, epigastric distress, abdominal cramping, diarrhea, constipation; mesenteric arterial thrombosis, ischemic colitis.

Allergic. Pharyngitis and agranulocytosis, erythematous rash; fever combined with aching and sore throat, laryngospasm and respiratory distress.

Respiratory Bronchospasm.

Hematologic: Agranulocytosis, nonthrombocytopenic purpura, thrombocytopenic purpura

Auto-Immune: In extremely rare instances, systemic lupus erythematosus has been reported.

Miscellaneous Alopecia; LE-like reactions, psoriasiform rashes, dry eyes; male impotence, and Peyronie's disease have been reported rarely. Oculomucocutaneous reactions involving the skin, serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol.

Hydrochlorothiazide:

Gastrointestinal: Anorexia, gastric irritation, nausea, vomiting, cramping, diarrhea, constipation; jaundice (intrahepatic cholestatic jaundice); pancreatitis; sialadenitis

Central Nervous System Dizziness, vertigo; paresthesias; headache; xanthopsia.

Hematologic: Leukopenia; agranulocytosis, thrombocytopenia, aplastic anemia

Cardiovascular. Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).

Hypersensitivity: Purpura, photosensitivity, rash; urticaria, necrotizing angiitis (vasculitis, cutaneous vasculitis); fever, respiratory distress, including pneumonitis, anaphylactic reactions

Other. Hyperglycemia, glycosuria, hyperuricemia, muscle spasm, weakness; restlessness, transient blurred vision.

Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

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Temporary Left Heart Assist for Open Heart Surgery Patients:

Clinical Experience from a Community Hospital and Review of the Literature

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Five patients have undergone left ventricular assistance using a centrifugal extracorporeal blood pump in a community hospital setting. Each of these patients had sustained severe left ventricular failure following open cardiac surgery which was refractory to inotropic agents and intra-aortic balloon counterpulsation, making it impossible to wean them from cardiopulmonary bypass without certain death.

All five patients were successfully weaned from cardiopulmonary bypass, four of them eventually succumbed, and one patient survived. An analysis of the factors involved in the selection and management of these patients and a review of the literature allows the following conclusions: 1) Selected post-cardiotomy patients with left ventricular failure or biventricular failure may be candidates for temporary extracorporeal ventricular assistance, with an expected salvage rate of about 20 percent. 2) The indications for this intervention have been clearly defined. 3) Once initiated, the heart assist should not be prematurely discontinued, since most patients are unlikely to respond before 24 hours. 4) Unnecessary delays in instituting ventricular assist, premature discontinuance of it, failure to recognize and treat biventricular failure, and the failure to identify those patients who are hopelessly unsalvageable are common causes of poor results.

Introduction

Since John Gibbon first reported on the use of a mechanical heart-lung machine to cardiac surgery 1954, many have tried to apply similar technology to the support of the failing ventricle. Until fairly recently, most of these efforts were regarded as largely experimental and were carried on only in major academic medical centers. Since the equipment required was usually prohibitively expensive and complex, and not available to the medical community at large, little serious thought was given to using such techniques in community hospitals.

With the increasing volume of open cardiac surgery performed in smaller hospitals over the past fifteen years, more patients are presenting as candidates for some type of temporary ventricular support who are refractory to the usual adjustments in metabolism, pre-load and after-load, and the use of inotropes and intra-aortic balloon counterpulsation.

The experience gained in one local community hospital using a left ventricular assist device following open heart surgery is relevant because of the large number of institutions that are faced with similar problems. It is the purpose of this paper to examine the factors involved in the selecting and managing of these patients and to compare published results from other major institutions.

Methods and Material

Since May of 1978, two commercially available centrifugal pumps have been used in one community hospital in five cases of postcardiotomy left ventricular failure in order to establish a left heart assist (LHA). In each case, it was not otherwise possible to wean the patient from cardiopulmonary bypass following (CPB) following open heart surgery.

The Bio-Pump (Bio-Medicus, Inc., Minnetonka, Minnesota) has rotator cones which are made from acrylic. They impart a vortex motion to the blood thus generating a centrifugal force. The pump is designed to minimize turbulence and so minimize damage to blood elements. The pump is inlet flow and outlet pressure responsive, so that at a fixed RPM, with inflow diminished or against a higher head of pressure, pump flow will diminish and conversely. Thus it mimics somewhat the responses of the natural heart to changes in pre- and afterload. A magnetic drive and solid housing design prevent air or contaminant introduction.

The Centrimed (R) centrifugal blood pump (Centrimed Corporation, Hopkins, Minnesota) has a multibladed impeller made of acrylic which imparts a circular motion to the blood. The pump is designed to minimize hemolysis and thrombogenicity. Because of the light weight control panel and relatively small pump head size, the unit may be located inside the sterile field, thus reducing the length of the blood conduit and minimizing the number of connections.

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Several surgical teams were involved. Cannulation techniques varied somewhat between surgeons. In most cases, cannulation of the ascending aorta was accomplished using sizes 22 F to 34 F cannulae (USCI or Sarns) and the left atrium or ventricle usually with a 32 F cannula. Most placed cannulae through buttressed sutures and/or sewed dacron grafts to aorta and ventricle and intubated the grafts with the cannulae. In each case, the cannula was placed in the left ventricle to drain the left heart.

Three-eighths inch polyvinyl chloride tubing (Tygon (R)) and polycarbonate connectors (Cobe Laboratories, Inc. Cranbury, New Jersey) were used to connect the tubing to the Bio-Pump (R). No reservoirs or oxygenators were used in the LHA circuit. The circuit was generally primed with Plasmalyte (R) (Travenol Laboratories, Inc., Deerfield, Illinois) and albumin, and with volume from the patient while on CPB.

All patients had a prolonged period of CBP support prior to instituting LHA. Each had maximum adjustment of metabolic factors, pre-load and afterload, intra-aortic balloon pump (IABP) counterpulsation, and a variety of pharmacologic agents including calcium, bicarbonate, Lanoxin, and vasopressors. Ventilation with 100 percent oxygen was customary once LHA was begun. Arterial pressure was monitored using a radial artery catheter. Pulmonary artery pressures were obtained using Swan-Ganz catheters. Serial postoperative laboratory values and arterial blood gases were determined. Serial cardiac output determinations were made using standard thermodilution techniques. LHA flow rates were determined by using a precalibrated on-line electromagnetic flow meter in the perfusion circuit.

A review of pertinent literature was carried out in order to determine the results of ventricular assist in postcardiotomy patients with intractable ventricular failure. Only reported results from major centers were included. Updated data from these centers which were presented at major symposia were also included and were noted as such. Results that were tabulated included the number of patients, the incidence of successful weaning from cardiopulmonary bypass, and survival after weaning from the assist device. In most instances, the type of assist device, whether centrifugal, pneumatic or roller pump, were noted. A listing of reported complications associated with ventricular assist was attempted.

A simple statistical comparison of the results of ventricular assist using the three types of pumps was made. The comparison was performed with respect to survivors versus non-survivors using the chi square two by two contingency method.[57] The results with each pump type were thus compared with results from the other two pump types.

Clinical Experience

Cases

The first case was done on May 15, 1978 and probably represents the first clinical use of the Bio-Pump for left heart assist. From May, 1978 until the present, five patients have been placed on left heart assist (LHA) following open heart surgery. Since there were 1,487 open heart operations performed over the entire period, 0.3 percent of all cardiac surgical patients were placed on LHA. In four cases, the Bio-Pump (R) was used in a simplified circuit,

TABLE 1

Analysis of Patients Receiving LHA in a Community Hospital from 1978 to 1986

Case No.	*Age*	*Sex*	*Preop Diagnosis*	*Operative Procedure*	*Date*
1	43	F	CAD, unstable angina	DSVG	5/15/78
2	61	M	CAD, cardiogenic shock	TSVG	10/26/84
3	71	M	CAD, unstable angina	DIMAG + EDTX	3/01/85
4	51	M	CAD, cardiogenic shock	DSVG + VAR	11/07/85
5	34	F	CAD, atypical angina	LIMA + SSVG	2/26/86

CAD = coronary artery disease
SSVG = single saphenous vein graft
DSVG = double saphenous vein graft
TSVG = triple saphenous vein graft
LIMA = left internal mammary artery graft
DIMAG = double internal mammary artery graft
EDTX = endarterectomy
VAR = ventricular aneurysm repair

without a return reservoir or oxygenator, to bypass the left ventricle. In one case, a Centrimed (R) pump was used in similar fashion. In each case, the patient was then weaned from cardiopulmonary bypass (CPB) which would not have otherwise been possible.

Table 1

An analysis of these patients is shown in Table 1. Ages ranged from 34 to 71 years. There were three males and two females. All five patients had coronary artery disease, two had unstable angina preoperatively and two presented with cardiogenic shock following an acute myocardial infarction. All five were classified as high risk. Two patients were operated upon as an emergency, one a semi-emergency and two electively. Each patient underwent some type of myocardial revascularization, one also had coronary endarterectomy and one a ventricular aneurysm repair.

TABLE 2

Analysis of Patients Who Received LHA in a Community Hospital

Case No.	*Preop. Ejection Fraction (%)*	*Maximum LVEDP (mm HG)*	*Initial CPB Time (min)*	*Cross Clamp Time (min)*	*No. Times CPB*	*Add'l CPB Support (min)*	*Total Blood Products**
1	30	30	120	40	5	79	12
2	—	—	240	60	2	89	55
3	40	30	178	113	8	57	56
4	20	35	121	65	2	88	4
5	30	30	256	94	2	153	41

LVEDP = left ventricular end diastolic pressure
CPB = cardiopulmonary bypass

*includes whole blood, packed RBCs, plasma, albumin, platelets and cryoprecipitate

Table 2

Table 2 summarized data concerning preoperative ejection fraction (EF), a left ventricular end diastolic pressure (LVEDP), CPB time, aortic cross clamp time, the number of times CPB was reinstituted in an attempt to support the failing heart, the total time of additional support after the initial bypass, and the total blood products used through the entire procedure and during LHA. Three patients had reduced EFs preoperatively, but not enough to preclude surgery. No ventriculogram was done in one (Case No. 2) because the patient was in cardiogenic shock. LVEDPs were modestly elevated in four patients. Initial CPB time averaged about 183 + 64 (Mean ± 1S.D.) minutes and aortic cross clamp time about 74 ± 29 (range 40 to 113) minutes. Some of the initial CPB time of the second and fifth patient represents support time.

The average number of times that patients were placed back on CPB for support, prior to LHA, was about four (range 2 to 8) times. The mean total additional support time was 93 ± 36 (range 57 to 153) minutes. The average number of all blood products given to each patient was about 34 ± 24 (range 4 to 56) minutes, including whole blood, packed RBCs, plasma, albumin, platelets and cryoprecipitate.

TABLE 3

Results of LHA in a Community Hospital

Case No.	*LHA Time hrs.*	*Flow Rate cc/min*	*Complications*	*Outcome*
1	80 min.	3.5 L/min	Low BP, inadequate return, RV failure	died
2	120 min.	3.5	Hemoperitoneum, occult volume loss	died
3	16 hrs.	1.8	CNS injury, RV failure, bleeding, sudden cyanosis	died
4	17 min.	1.0	Low BP, inadequate return, RV failure	died
5	106 hrs.	2 - 4	Pump thrombus, left hemiparesis	alive

Table 3

Table 3 summarizes the LHA time, mean flow rates, the major complications associated with LHA, and the outcome for the five patients. LHA time ranged from 17 minutes to 106 hours (mean 25±46 hrs). The patients that had the longest LHA time (Cases 3 and 5) were able to be weaned down to flow rates of 1800 to 2000 cc/minute in comparison with two other patients who were unable to sustain adequate blood pressures even with LHA flows of 3500 cc/min. In one patient (Case No. 4), it was not possible to obtain sufficient return to perfuse at an adequate flow rate.

Reasons for Discontinuing LHA

A common reason for discontinuing LHA in four of the patients was the inability to maintain an adequate arterial blood pressure. Terminally, each of these patients showed progressive arterial hypotension, rising pulmonary artery pressures with associated right ventricular failure, progressive metabolic acidosis and renal shutdown. In each instance, this shock-like state was associated with inadequate return to the LHA circuit and required the addition of volume in order to maintain flow. In Case No. 2, the volume loss may have been associated with intra-abdominal bleeding. In each of these four cases, progressive right ventricular failure was a problem.

In Case No. 3, a failure to respond or make any purposeful movements after 16 hours suggested CNS injury and was used as a rationale for the discontinuance of LHA. Sudden cyanosis was also encountered in this patient and was associated with the onset of right ventricular failure which may have been the result of right to left shunting through a patent foramen ovale.

Case No. 5 represents the longest survivor to date. Figure 1 shows the effect of five minute discontinuation of LHA and IABP on mean arterial pressure (MAP), systemic vascular resistance (SVR) and cardiac output (C.O.) after 24 hours of support prior to recovery of ventricular function. When LHA was discontinued, there was a marked fall in C.O. Cardiac output was further reduced when IABP was turned off. During these transient interventions, MAP was maintained despite marked reductions in C.O. when SVR increased. Figure 2 shows the recovery of left ventricular function which occurred over a four day period. As the LHA flow rate was decreased from 4000 to 2000 cc/min, the patient's own left ventricular contribution (LVCF) to total systemic blood flow (TSBF) gradually increased, even though the initial LVCF was quite small. This patient suffered a stroke sometime during the LHA support time. Even though the activated clotting time (ACT) was maintained at or above 150 seconds with intravenous heparin, and the LHA flow rate was always at least 2000 cc per

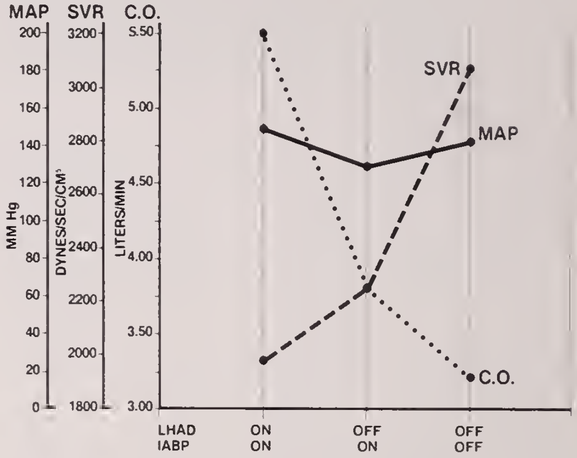

Figure 1 - Example (Case No. 5) of the effect of abrupt discontinuation of left heart assist (LHA) and intra-aortic balloon pump (IABP) on mean arterial pressure (MAP), systemic vascular resistance (SVR) and cardiac output (C.O.) after only 24 hours of support, prior to recovery of ventricular function. Note the large decrease in C.O. that occurs when LHA is discontinued as compared to when IABP is turned off. Note also that MAP is maintained despite marked reduction in C.O. by virtue of extreme increases in SVR, thus emphasizing the need to monitor C.O.

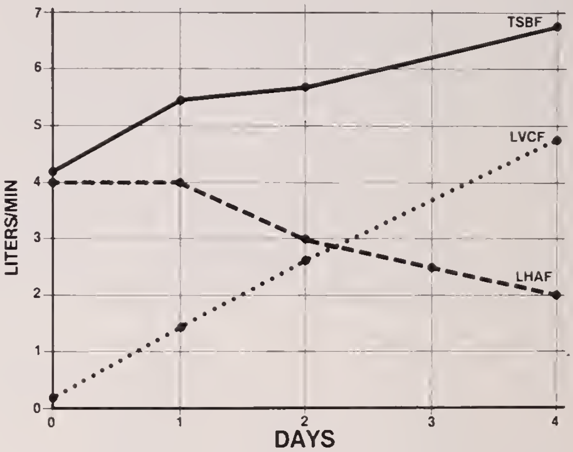

Figure 2 - Example (Case No. 5) of gradual recovery of left ventricular function during four days of left heart assist. Ordinate shows flow in liters per minute, abscissa shows time in days. TSBF = total systemic blood flow, as determined by thermodilution cardiac output measurements. LHAF left heart assist flow, as determined by electromagnetic flowmeter. LVCF = left ventricular contribution to flow, calculated from LVCF = TSBF − LHAF.

minute, thrombus was found in the centrifugal pump housing. Figure 3 shows the pump head containing thrombus after the 4 day run. This pump head was the only one that was used throughout the entire run.

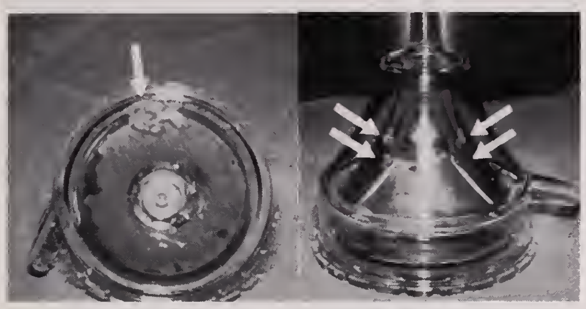

Figure 3 - Photograph showing thrombus in pump head of Bio-Pump (R) after about 106 hours of left heart assist pumping. Continuous heparinization was used to maintain the ACT at or above 150 seconds and flows were kept at or above 2000 cc per minute. No other pump head was used for LHA on this patient during the entire run. The patient developed a left hemiparesis but is recovering.

Case Reports

Case 1

A 43-year-old homemaker was admitted to NMH on May 2, 1978, her third hospital admission within four weeks because of recurrent angina pectoris. Her risk factors included chronic hypertension, non-insulin dependent diabetes mellitus, a previous myocardial infarction four years ago, abnormal serum lipoprotein pattern suggesting Type IIB hyperlipidemia, a marked family history of early death from coronary disease, a history of heavy smoking, and pronounced obesity. She had been taking Inderal and Nitrobid. Examination revealed a blood pressure of 112/68, xanthomas over both eyelids, height 5 feet 1 inch, weight 195 pounds. The EKG initially showed extensive new anterior wall ischemia.

Because her angina was unstable, the angiogram was initially delayed. The CPK and MB fraction remained normal. Angiography was performed seven days after admission. There was a 95 percent narrowing of the proximal LAD, a relatively normal dominant RCA with 50 percent stenosis of an acute marginal branch. A small posterior wall ventricular aneurysm near the apex was present. There was significant apical-inferior wall hypokinesis and an ejection fraction of about 30 percent. A trace of mitral regurgitation was present and the left ventricular end diastolic pressure was only 13 at rest but rose to 30 with mild exercise. Because of medically refractory angina, she was considered a candidate for myocardial revascularization.

At surgery on May 15, 1978, the left ventricular wall was found to be thickened and diffusely scarred but without a discrete aneurysm. Saphenous vein bypass grafts were constructed from the aorta to the LAD and first diagonal coronary arteries using cold cardioplegic arrest. Aortic cross clamp time was about 40 minutes. After rewarming, it was not possible to wean the patient from CPB. She was given calcium, lanoxin, dopamine, levophed, bicarbonate and an intra-aortic balloon catheter was inserted. She was placed back on CPB four more times for support. The initial pump time was 2 hours and was followed by support times of 84, 12, 8, and 59 minutes. Each attempt to wean from CPB was prevented by left ventricular failure.

During the fourth weaning trial, a left heart assist (LHA) system was installed. At that time, the arterial blood gases were within acceptable limits. Wire reinforced 34 F cannulae were inserted through 12 mm woven dacron tubular prostheses sewn to the ascending aorta and to the apex of the left ventricle. Left ventricular to aortic assist was circulated through a centrifugal pump without an oxygenator using 3/8 inch Tygon tubing. Flows of 3 liters were required to maintain the mean arterial pressure at 70 to 80 mm Hg. Protamine was given to neutralize the heparin. She remained relatively stable for about one hour while still in the operating room. But the blood pressure fell into the 40s and the pulmonary artery pressure rose when an attempt was made to increase the flow to 4 liters. Additional bicarbonate, blood and pressors were not helpful in restoring the pressure. So the ventricular assist was discontinued after 1 hour and 20 minutes and she expired.

Case Two

A 71-year-old male with chronic hypertension was admitted with chest pain and a history of myocardial infarction one week prior. Medications included Nitrobid, Tenormin, and Procardia. He was allergic to penicillin and IVP dye. He had undergone a complete bilateral vein stripping in the past. The EKG showed old Q waves inferiorly. CPK and MB fraction enzymes were elevated.

He was transferred to NMH were angiography was performed six days later. At catheterization, a 90 percent stenosis of the left main orifice and other tight stenoses in the proximal and mid LAD were noted. There was total occlusion of the first descending marginal branch of the CFX. RCA was non-dominant with a tight stenosis and multiple narrowings of lesser degree. The inferior wall was hypokinetic, there was trivial mitral regurgitation, the ejection fraction was 40 percent. LVEDP rose from 20 to 30 with exercise and the PAP was 28/16. He was considered a candidate for surgery.

A double mammary artery coronary bypass was done, the left internal mammary artery bypassing the LAD and the right internal mammary artery to the distal RCA. An endarterectomy of the proximal LAD, two diagonals and the proximal CFX was repaired with a vein patch arterioplasty. Cold cardioplegia with a cross clamp time of 113 minutes was employed. After rewarming, numerous attempts were made to wean CPB. The initial bypass was for 3 hours. Seven additional periods of CPB support were tried over the next hour. An intra-aortic balloon catheter was inserted. CPB was finally weaned using Levophed, Regitine, Neosynephrine and Dobutrex. Protamine was given. About 1 hour later, hemodynamics deteriorated and ventricular fibrillation occurred. Manual cardiac massage and CPB were restarted.

Because of the inability to wean the patient from CPB despite Dobutamine and IAB counterpulsation, LHA was inserted. A 32 F catheter was passed into the left ventricle via the left atrial appendage. An 8 F Sarns cannula was placed in the ascending aorta through buttressed stitches. Left ventricular to aortic flow was maintained at 1800 cc/min using centrifugal pump without an oxygenator. The heart was electrically defibrillated and a right ventricular temporary lead was placed. CPB was discontinued. Additional protamine and antibiotics were given. He was brought to the PAR 12 hours after surgery had begun.

The blood pressure was 126/52, PAP 21/12, urine output satisfactory for the first few hours. Arterial blood gases were closely monitored and indicated a low PO_2 of 86 ($FIO_2=100$ percent), a slowly rising base deficit (from 3.9 to 10.1) and progressive metabolic acidosis (from 7.34 to 7.20) over 16 hours. During this time, the CPK of 3402 rose to 4208, Hb fell from 9.3 to 8.09, BUN 27, suggesting continuing myocardial ischemic injury, minimal hemolysis, and maintenance of renal function. Chest tubes drained 2500 cc.

After 4 hours, BP fell to 90 and the PAP began to rise. In 8 hours, BP was 60/70, PAP 26/18. After 16 hours of LHA, the BP suddenly fell, the blood in the circuit turned quite cyanotic, and urine output ceased. Because he had not responded at all, CNS injury was suspected. Since his heart generated no discernible pressure on its own, the LHA was discontinued and he expired.

Case Three

A 61-year-old man was admitted to NMH with sudden onset of chest pain associated with cardiogenic shock and EKG evidence of acute myocardial infarction. An intra-aortic balloon was inserted and cardiac catheterization promptly done. A totally occluded left main coronary artery and a normal dominant RCA were found. No ventriculogram was done. Intracoronary thrombolysis with streptokinase was attempted, but there remained a high grade residual stenosis of the vessel. His BP was 70. Emergency coronary revascularization was recommended.

CPB was promptly started using veno-arterial perfusion accessed via groin vessels. Sternotomy and atrial cannulation were then performed. The left ventricle was noted to be non-contracting. The aorta was cross-clamped and cardioplegia solution infused. A single saphenous vein graft was placed between aorta and LAD. Upon rewarming, the right ventricle was seen to contract well but the left ventricle was not moving and he could not be weaned from CPB. After the initial 4 hours of CPB, a left heart assist system was placed. Cannulation was done via the left atrial appendage into the left ventricle and at the ascending aorta and the LHA circuit connected to a centrifugal pump. With LHA, IAB, Levophed and Regitine running, CPB was discontinued.

It was not possible to maintain adequate BP despite pressors and volume addition. BP remained about 60. Arterial blood gases indicated pH 7.34, pCo_2 50, pO_2 56, B.E. -1. Because of persistent volume deficits, the abdomen was opened and significant hemoperitoneum was discovered without a discernible site of visceral injury. After 2 hours of LHA, the situation was regarded as unsalvageable. LHA was discontinued and he expired.

Case Four

A 51-year-old male machine shop operator with a long history of non-insulin dependent diabetes mellitus and hypertension was admitted with dyspnea and diabetes out of control. Chest X-rays showed progressive pulmonary edema. He did not complain of chest pain. EKG showed sinus tachycardia, intraventricular conduction defect, left anterior hemi-block, and non-specific ST and T wave changes. He continued to deteriorate. Right heart catheterization with a Swan Ganz catheter revealed a pulmonary wedge pressure of 40 mm Hg. A diagnosis of acute anterior myocardial infarction with associated cardiogenic shock was made. Intra-aortic balloon counterpulsation and inotropic agents were used. Left heart catheterization was carried out 4 days after admission. The LAD was completely occluded near its origin and the distal LAD was poorly visualized. The circumflex and RCA were also tightly stenosed in several areas. The left ventricular contraction was profoundly impaired due to extensive aneurysm formation involving the septum, antero-lateral, apical and inferior segments of the left ventricle. The basal and posterolateral wall of the ventricle contracted vigorously. A large clot was seen in the aneurysm. LVEDP was 35 mm Hg. Urgent ventricular aneurysm repair and coronary revascularization were undertaken.

Surgery began with the patient requiring pressors to maintain an arterial blood pressure in the 90s. Cold cardioplegia was used. The ventricular aneurysm was repaired and saphenous vein bypass from the aorta to the distal RCA and the first descending marginal branch of the CFX was performed. It was not possible to wean the patient from CPB. A-V sequential pacing was tried. With partial CPB, flowing at 1 liter/min, it was possible to maintain a pressure of 70 mm Hg. Aortic cross clamp time was 65 minutes. The initial CPB time of 121 minutes was followed by a second CPB time of 88 minutes which included 25 minutes of "partial bypass" with flows at 1 liter per minute. Left ventricular assist was initiated. A 5.9 mm Sarns aortic cannula was threaded from the ascending aorta past the left subclavian artery and the left atrium was cannulated with a venous cannula through the appendage. The patient was weaned from CPB but it was not possible to maintain an adequate arterial pressure with the LHA, largely because of inadequate return associated with biventricular failure. After 17 minutes of LHA, efforts were discontinued and he expired. A postmortem examination indicated the presence of a massive anteroseptal myocardial infarction, severe 3 vessel CAD, a thrombosed LAD, multiple small pulmonary emboli and a small peripheral pulmonary infarct.

Case Five

A 34-year-old female with non-insulin dependent diabetes, chronic hypertensive cardiovascular disease, hypercholesterolemia and hypertriglyceridemia, a two pack per day smoker, presented with episodic irregular heart beat and atypical chest pain. Holter monitor revealed multiforme premature ventricular complexes with coupling, an echocardiogram showed inferior wall motion abnormality, and a stress test showed 3 mm ST segment depression at Stage I of the Bruce protocol, despite a normal resting EKG. A grade II/VI systolic ejection murmur was present. An angiogram revealed 60 percent narrowing LMCA, 50 percent narrowing mid LAD, 60 percent narrowing of LV branch of RCA and proximal PDCA, 90 percent narrowing of proximal CFX, and involvement of first diagonal and descending marginal branches. Ejection fraction was reduced. Elective myocardial revascularization was recommended.

A double coronary bypass was performed using the left internal mammary artery to the LAD and a saphenous vein to the RCA. Blood cardioplegia was used. The aortic cross clamp time was 94 minutes. It was very difficult to wean the patient from CPB. Initial total CPB time was 256 minutes. She was returned to the ICU with borderline hemodynamics despite a pressor infusion. There followed a sudden fall in BP to 60 mm Hg. Closed chest massage was begun and she was returned to the operating room.

CPB was reinstituted. An IABP catheter was placed. After 153 minutes of CPB, an LHA circuit was installed. The 8.0 mm Sarns aortic cannula that had been placed for CPB was used. A No. 38 USCI venous uptake catheter was placed in the left ventricle via the right superior pulmonary vein. With a LHA flow rate of 4000 cc per minute, hemodynamics stabilized. Only the skin was closed and she was returned to ICU.

Left ventricular function steadily improved over the next four days. LHA flows were decreased in a stepwise fashion down to 2000 cc per minute. The ACT was maintained at 150 seconds. No bleeding problems occurred. After 106 hours, the LHA was removed. Following this, the patient was noted to have a hemeparesis. Thrombus was noted in the pump head at the termination of the LHA run. Presently, she continues to recover and has left the hospital.

Literature Review

Current Results of Clinical Application of Ventricular Assist

With data taken from a review of the current literature as well as updated data from a recent symposium, the results of the clinical application of ventricular assist devices to postcardiotomy patients has been compiled.[2-4,8-15,34-41] These results are summarized in Table 4. Data from 14 major centers are presented, three of which are outside of the United States.

TABLE 4
Reported Clinical Use of Ventricular Assist Devices Following Open Heart Surgery from
14 Major Centers from 1978 through 1985

Center	*Reference*	*Device*	*Patients*	*Weaned*	*Survived*
New York	Rose[9]	R	46	21	16
St. Louis	Pennington[3,4,15]	R,C,P+	52	14	11
Boston	Bernhard[12]	P	22	8	3
Cleveland	Golding[34,52*]	C	18	12	4
New York	Litwak[10]	R	27	18	9
Pittsburgh	Magovern[8*]	C	41	22	12
Hershey	Pierce[11]	P	29	13	9
Houston	Norman[35]	P	22	2	0
Salt Lake City	Peters[36]	R	6	2	1
Augusta	Zumbro[2]	C	16	10	3
San Francisco	Hill[13,37]	R,C,P	20	5	2
Tokyo	Taguchi[38,39]	R	27	13	8
Zurich	Turina[40]	P	4	3	2
Vienna	Wolner[41]	P	8	2	0
TOTAL			338	163	80

R = roller pump
C = centrifugal pump
P = pneumatic pump

*Data updated at the Symposium on the Use of the Centrifugal Pump for Ventricular Assist, Pittsburgh, December 7, 1985.

+ Includes 35 centrifugal and 17 pneumatic pump patients, no ECMO.

A total of 338 patients are included in this review. All patients underwent treatment with a ventricular assist devise following open heart surgery. Some of the reports originate as early as 1978 and included a few patients who were treated in the early 1970s. The large majority were treated after 1975. Several different devices and circuits have been used, even by a single investigator. The most commonly used device has been the roller pump, the pneumatic devices and centrifugal pumps being less often used. Although it was possible to wean all of these patients from CPB with the aid of the assist device, only 163 patients, or about half, could be weaned from the assist device. Of these, 80 patients, about half of those weaned (about one-quarter of the total group) survived.

Some authors have reported survivors for as long as 10 years.[10] Many of these survivors are in NYHA functional class I or II.[7,9,11,15] Some were noted to have improved ventricular function from preop.[15] Sudden late deaths among survivors have also been noted.[8,9,11,16]

Complications

Most authors have reported similar complications associated with the use of ventricular assist.[2,8-12,16] Most of these are set forth in Table 5. While it was not possible to quantitate these accurately from all the reports, it would appear that bleeding, respiratory failure, right ventricular failure, failure of the myocardium to recover, inadequate return drainage, renal failure and sepsis are the major problems. Several authors note that CNS injury may preclude survival.[2,4,8,16]

TABLE 5
Reported Complications
Associated with Ventricular Assist

- surgical bleeding
- coagulopathy
- hematologic disorders
- respiratory failure
- sepsis (immediate and delayed)
- renal failure
- central nervous system injury
- right ventricular failure
- right to left shunting
- air embolism
- systemic embolism (clot)
- failure of myocardium to recover
- IABP related
- inadequate return drainage
- cannula obstruction
- hemolysis
- thrombus in system
- pump mechanism failure

The occurrence of right ventricular (RV) failure during LHA has been frequently reported.[2,3,5,8,9,13,17-20] Several suggestions have been made as to the cause of RV failure during LHA. These include: 1) initially unrecognized RV failure masked by LV failure[11], 2) factors inherent in LHA such as shifting of the ventricular septum that contribute to RV failure[13], 3) extension of ischemic injury to the RV[9], and 4) progressive elevation of pulmonary vascular resistance.[11] Some have been able to manage RV failure during LHA with drugs.[13,16] Others feel that biventricular assist is the preferred method of handling this problem.[3,5,13] The use of pulmonary artery balloon counter-pulsation under these circumstances has been suggested[13], but as yet has not been shown to be useful.[14] Some authors feel that RV failure poses a very definite limitation to LHA.[11,13,21] Gaines and his coworkers[11] have suggested an intraoperative test which may be used to assess RV function. The left atrium is cannulated with a 51 F cannula and left heart bypass is instituted. Those patients who, because of inadequate RV function and/or elevated pulmonary vascular resistance, are unable to generate adequate pulmonary blood flow to provide greater than 1.8 L/min per M2 of left atrial return to the oxygenator will probably require biventricular assistance.

The occurrence of right to left shunting through a patent foramen ovale has led to the suggestion that the atrium be explored digitally and if one is found, it should be closed prior to the institution of left heart assist.[11,22]

For patients who may exhibit fluid retention secondary to prolonged perfusion and reduced renal function, the use of ultrafiltration rather than hemodialysis has been recommended.[14,23] Severe renal failure requiring dialysis has almost always precluded survival.[3,15,16,18]

Injury to the CNS may be due to inadequate cerebral perfusion or embolization.[4] A mean perfusion pressure of at least 70 mm Hg is probably safe for most patients.[24] Reduction of the embolization of particulate matter to the brain may be accomplished by using low dose heparin[2,4,16], by advancing the arterial cannulae beyond the origin of the cerebral vessels[16], by periodically rotating the tubing in roller pump heads[16], or by changing the pump head itself in the case of a centrifugal pump[4,14,25], and by maintaining flow rates at least 1.5 L/min to prevent thrombus formation in the circuit.[2] One advantage inherent to the use of a centrifugal pump is the decreased likelihood of developing excessive negative suction with resultant cavitation or the drawing in of air around cannulae sites.[3,26,27] Raising the pump to the level of the patient may also be helpful in reducing the potential for developing high negative suction.[25] Also, if air is entrapped in the system, it is likely to be contained in the center of the vortex and not be pumped into the patient.[27] Mechanical pump failure has been reported by several authors.[3,4] Having an extra pump available is necessary to ensure safety.[14,25]

A common problem has been inadequate return of blood from the heart so that an adequate perfusion can be maintained.[8,13,26] While this problem is often related to biventricular failure or changes in pulmonary vascular resistance[2,3,8,13], obstruction of the uptake cannula may occur and sometimes frequent repositioning of the return cannula may be necessary in order to maintain an adequate return.[14,33]

While most of the devices used have been tested for excessive hemolysis under normal operating conditions[28-32], attempting to maintain an inflow against a high resistance that might result from an obstructed infusion cannula, particularly by increasing the RPMs of a centrifugal pump, has resulted in excessive hemolysis.[14]

A number of reported complications relate to the use of intra-aortic balloon catheters with LHA. Most of these problems involve impairment of lower extremity circulation which may be aggravated by low cardiac output.[3]

Comparison Between Centrifugal, Pneumatic and Roller Pumps

A statistical comparison can be made between the results of ventricular assist using the three basic types of pump devices, centrifugal, pneumatic, and roller. Table 6 shows the results of such an analysis using the available collected data. The lowest survival rate found here is 16 percent and is associated with the pneumatic pumping devices ($P<0.05$). Results were significantly better with the standard roller pump (32 percent survival, $P<0.05$). Survival using the centrifugal pump is 25 percent, not significantly different from the results obtained using both of the other types of pumps, but better than those results obtained with pneumatic pumps alone ($P<0.05$).

Discussion

With respect to survival, the results of left heart assist in post-cardiotomy patients in one of our community hospitals is not as encouraging as the results from some major centers published in the literature. There are several possible explanations for this apparent discrepancy. First, the selection of cases for LHA undoubtedly has a significant influence on the outcome of the treatment. If massive and irreversible myonecrosis has already occurred prior to the institution of LHA, recovery of the patient is not possible without total cardiac replacement. Second, a delay in the initiation of LHA or an inadequate ventricular assistance may result in the progression of a potentially recoverable degree of myocardial injury to an irretrievable state of ventricular dysfunction.

Two of the patients in the present series had cardiogenic shock for a protracted period preoperatively. All of them had almost an hour or more of additional support time on CPB and two of them had five or more additional attempts at CPB before LHA was instituted. One patient had a prolonged support at low flow in an attempt to wean from CPB. At least two of them probably had massive myonecrosis and ventricular dysfunction for some time prior to surgery.

The presence of cardiogenic shock has been equated with the functional loss of forty percent or more of the myocardium.[42] Reversibility of myocardial ischemic injury has been demonstrated to be related to the severity and duration of ischemia, and without successful intervention, more than four to six hours of profound ischemia has been associated with irreversible myocardial injury.[43-46] It follows that patients who have suffered therapeutically unresponsive cardiogenic shock for more than four to six hours are not likely to survive myocardial revascularization, even with the aid of post-reperfusion ventricular assistance. While cases have been reported of survival following LHA in patients who had preoperative cardiogenic shock, such cases are rare.[14,17]

No conclusive evidence has as yet been provided to support the view that pulsatile pumping is superior to non-pulsatile pumping.[47-50] Long term perfusion with non-pulsatile pumps has been demonstrated to be reasonably well-tolerated in animals.[50] Since most of the postcardiotomy patients undergoing ventricular assistance have an IABP in place, some degree of pulsatile perfusion is usually present, even when the support device provides only asynchronous non-pulsatile flow.[8,9,14]

When a statistical comparison is made between the results of ventricular assist with the three basic types of devices, centrifugal, pneumatic, and roller pumps, the data suggests that it is the criteria for patient selection and other factors that determine the outcome, rather than the type of pump mechanism used (see Table 6). Ironically, the most sophisticated equipment in use, the pneumatic pumps, have thus far been associated with the poorest results (16 percent survival). The results are significantly better with the standard roller pump (32 percent survival). Survival using the centrifugal pump is 25 percent, not significantly different from the results obtained using both of the other types of pumps, but better than those results obtained with pneumatic pumps alone.

TABLE 6

Statistical Comparison of Published Results of Ventricular Assist Between Centrifugal, Pneumatic, and Roller Pumps

Pump	*Patients*	*Survived*	*%*	*P Value**
Centrifugal	75	19	25	N.S.
Pneumatic	85	14	16	<0.05
Roller	106	34	32	<0.05

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*Results from chi square analysis when compared with all other pumps.

Norman and associates naturally were concerned about the results of their studies, which were the earliest clinical trials to use a LHA device. These authors attribute their results to the extremely rigid criteria for patient selection that was required in order to justify the initial clinical study.[21,35] When these data are excluded from the analysis, there appear to be no significant statistical differences in survival data between the three basic types of pumps for ventricular assist. The early and subsequent experience of Spencer, et al.[56] and Litwak, et al.[10] may have had a favorable effect on the results using the roller pump.

The relatively poor results obtained with pneumatic pumps that are derived from analysis of the reported results from the literature should not be interpreted to mean that non-pulsatile support is superior. In fact, the contrary may be the case.[47-50,53] However, while pulsatile pneumatic synchronous ventricular assist may seem teleologically more desirable as an assist device, non-pulsatile asynchronous assist is currently much more widely available, simpler to use (which makes it more likely to be used early), and considerably less expensive.

Repeated attempts to wean a patient from CPB, often without adequate ventricular venting and during the use of vasopressors and inotropes, in a heart that has sustained recent ischemic injury, probably results in an unfavorable myocardial energy supply-demand ratio which is detrimental to myocardial preservation. Logically, a superior method would be to determine early in the course of CPB weaning whether or not a patient is likely to require prolonged ventricular assistance, and, if so, to institute that type of support early. Norman, et al.[51] have provided a solid rationale for the establishment of guidelines for the use of a ventricular assist device in postcardiotomy patients by showing that a subgroup of such patients clearly cannot survive without additional ventricular assistance plus IABP counterpulsation. These results and the criteria established by others provide clear indications for the initiation of ventricular assist in the postcardiotomy patient.[2,4,6,8,11] As yet, there is no reliable method for accurately predicting whether a given patient will survive or not with a ventricular assist device.[8,9,11,12,14]

Only one patient in the presently reported series survived a LHA for 24 hours. With each of the others, progressive deterioration prevented the continuation of the assist. There is accumulating evidence to support the concept that at least 24 hours of LHA support time is required before the myocardium can be expected to begin to show signs of recovery.[54,55] Once initiated, every effort should be made to continue LHA for at least 24 hours before giving up.

A comparison between our results from one community hospital and the results reported in the literature is the central issue of this report. Since many community hospitals have active heart surgery programs, many of these institutions are likely to attempt the use of a ventricular assist device in the near future. It would be unfortunate if initially poor results were to discourage further attempts to use this mode of treatment which has been clearly shown to be of benefit to some patients. Guidelines for the proper use of ventricular assist devices need to be disseminated and hospitals should establish their own protocols for use.

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Autologous Blood Transfusion:

Past Performance and Current Concerns

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The Minnesota Medical Association House of Delegates unanimously adopted the following resolution, submitted by the Stearns-Benton County Medical Society, during its May, 1985 annual meeting:

> "Resolved, that the Minnesota Medical Association educate physicians about the benefits and availability of autologous blood transfusions, and be it further resolved, that this resolution be conveyed to the American Medical Association House of Delegates for national action at the AMA meeting in June, 1985."[1]

While this resolution currently awaits action by the AMA, it is the purpose of this article to initiate this educational process by briefly reviewing the history of autologous blood transfusions, describing the principle modalities and accepted applications, discussing some of the fears and hesitations associated with autologous blood transfusion and detailing the feasibility and logistics of implementing such a program.

Autologous blood transfusion where the patient serves as his own blood donor and therefore receives the safest blood is not a new procedure. The first recorded use of autologous blood transfusion in the medical literature dates to 1818 when Dr. John Blundell utilized blood salvage and return to treat ten patients with severe postpartum hemorrhage.[2] Despite Dr. Blundell's innovative therapy and reasonable rate of success, with five of ten patients surviving, little serious attention was given to this therapeutic modality; although, sporadic reports do appear in the medical literature throughout the remainder of the 19th century.[3]

The history of autologous blood transfusion changed dramatically in 1915 with the development of the first sodium citrate blood anticoagulant. This established the ability to store blood *in vitro*.[4]

In 1921, Dr. F. C. Grant performed the first documented use of autologous predeposit phlebotomy in a patient undergoing elective surgery for a cerebellar tumor.[5] Autologous blood transfusion, predominantly of the predeposit phlebotomy type, became standard medical practice in the 1920's and early 1930's. However, with the advent of organized blood banks in the latter 1930's and early 1940's, catalyzed in part by the outbreak of World War II, homologous donation and transfusion emerged as the standard of practice. As the military and subsequently the medical community became more and more dependent on homologous blood, interest in autologous transfusion waned.[3] However, it gradually became apparent that transfusion with homologous blood is associated with an ever increasing number of transfusional complications, including reactions resulting from serologic incompatabilities (to erythrocytes, leucocytes and platelets), disease transmission, and other immune allergic reactions.[6] While an estimated 5% or more of homologous transfusion recipients may experience such a reaction,[7] clinically significant reactions are believed uncommon. Nonetheless, they are entirely eliminated with autologous blood, assuming correct patient identification.

The modern era of autologous blood transfusion dates to the 1960's. During that decade, and the decades to follow, post-transfusion hepatitis became a subject of increasing concern and study. Taswell and colleagues at the Mayo Clinic pioneered in the development of an early prototype of a semiautomated instrument to perform intraoperative blood salvage.[8] Milles and colleagues in Chicago launched an active, aggressive predeposit phlebotomy program culminating in a now classic monograph on "Autologous Transfusions."[9] More recently, according to American Association of Blood Bank Surveys, interest in and implementation of autologous transfusion programs has dramatically increased since 1970. Indeed although it is common to relate current interest in autologous blood transfusion to the emergence of AIDS, the number of operational autologous transfusion programs increased 16-fold between 1970 and 1981 before the term AIDS even existed.[10,11] More recent data demonstrates continued dramatic growth, undoubtedly fueled in part by the AIDS epidemic, in the number of programs and the overall activity of these programs.[12]

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The two principle modalities of autologous blood transfusion, alluded to above, are predeposit phlebotomy and intraoperative blood salvage. (Preoperative hemodilution and postoperative blood salvage, variations on the above and more limited in application, will not be specifically addressed.) Predeposit phlebotomy, where blood is drawn from the patient prior to surgery, is applicable to elective surgical procedures which normally require blood replacement. A maximum surgical blood order schedule, utilized by many blood banks, enables one to predict anticipated blood use for each kind of elective surgical procedure. It thus provides a guideline for the number of autologous units required. Typically, major orthopedic procedures such as total hip and knee replacement, plastic reconstructive and cosmetic surgery and some urologic procedures, such as total cystectomy and radical prostectomy are ideally suited for a predeposit phlebotomy autologous transfusion program.[13] Donor regulations and requirements for an autologous phlebotomy are substantially more flexible than homologous donor regulations and requirements. In general, criteria such as age and past or present medical problems do not affect autologous donor deferral provided the patient is a candidate for a major elective surgical procedure.[14] A report from Cedars-Sinai Medical Center in Los Angeles has demonstrated the safety of predeposit phlebotomy for certain high-risk individuals, including patients undergoing major elective cardiovascular surgery, patients over 70 years old, and a small number of pregnant women.[15] Deferrals, when they are rarely made, relate to low hemoglobin (less than 11.0 gms), active infection or bacteremia (e.g. recent dental procedure) or unstable vital signs. Predeposit phlebotomy may be performed as often as every three days terminating at least three days prior to surgery, provided that the hemoglobin is maintained at a level of a least 11 gms.[14] When two or more units are required, oral iron is routinely prescribed, ideally beginning 7-10 days prior to the initial phlebotomy.[16] Blood so obtained may be stored as whole blood up to five weeks prior to surgery. It is theoretically possible to obtain 11 units of blood by this method. In our institution, where an active predeposit autologous phlebotomy program now accounts for almost 10% of our total transfusion volume, most physicians request two units. This procedure, in our institution, is now the standard of practice for large elective orthopedic and plastic surgical procedures and many large urologic procedures.

Intraoperative autologous transfusion, where blood displaced during surgery is generally washed and recycled back to the recipient, is potentially applicable to any surgical procedure where significant blood loss occurs over a limited area. Major vascular and cardiothoracic surgical procedures are ideal. Traumatic injury with bleeding into the pleural cavity is also ideal. Relative contraindications include major cancer surgery, where surgical dislodging and subsequent reinfusion of tumor cells is feared and blood contaminated with gut flora (intestinal contents) where sepsis is feared.[17] In Minnesota, the Mayo Clinic has an active intraoperative blood salvage program, particularly for major vascular and cardiothoracic procedures. In general, where very rapid blood loss is anticipated, such as in major vascular procedures, a high-speed semicontinuous flow instrument is employed. A prototype of this instrument, developed initially at Baylor University College of Medicine and subsequently at the Mayo Clinic, will soon be marketed commercially by Cardiovascular Systems, Inc. (Kardiothor). With this high speed device it is possible to complete an entire cycle of salvage and return in three to four minutes. Where blood loss is less active and the time requirements for return are not so critical, it is possible to utilize less complex instrumentation such as the canister format of the Sorenson Autotransfusion System. Using such a system the time for blood salvaging, washing and return is typically 45-60 minutes with volumes from one to three units. At the Mayo Clinic the semicontinuous flow instrumentation is reported to be cost effective, compared to homologous blood, when greater than three units are processed. The canister mechanism is reported to be cost effective when one and one-half to two units are processed.[17]

Although interest in autologous transfusion continues to increase, and the number of programs continues to grow, utilization is limited and has not had a major impact, to date, on the national blood supply. Several factors contribute to this lack of utilization. A key factor is cost. Large regional blood suppliers often conclude that their programs, which are highly automated and draw blood from thousands of normal, healthy donors, run in a far more cost effective manner than a single donor program. Such cost estimates are inaccurate if they fail to consider several factors uniquely associated with autologous transfusion such as elimination of costs associated with donor recruitment (our donors are all referred by the attending physician), elimination of mandatory tests for disease transmission (including HTLV-III), elimination of mandatory crossmatching, and elimination of medical expenses associated with the 5% or more of homologous transfusion recipients experiencing a post-transfusion complication. While little data is available in the published literature, in Minnesota, experience with intraoperative autologous transfusion at the Mayo Clinic[17] and predeposit autologous phlebotomy at St. Cloud Hospital[18] suggest that autologous transfusion is a cost effective modality in these institutions.

A second group of factors impacting on the limited utilization of autologous transfusion relates to inertia, complacency and the perception that autologous transfusion is an inconvenience to the blood bank, the clinician, and the patient. In 1973, Zuck called homologous blood transfusion practice "a professional habit."[10] Later Swisher wrote, "Poor physician and patient acceptance and weak public support of programs of autologous transfusion are impediments to further development."[19] At St. Cloud Hospital, where an active education program accompanies our autologous blood program, there has been overwhelming acceptance by both physicians and patients. Importantly, the patients and physicians generally do not view the autologous procedure as a burdensome inconvenience. The program continues to grow with autologous blood transfusion accounting for 5% of the total transfusion volume in 1984, 8% in 1985, and almost 10% in the first two months of 1986.

A third factor accounting for the limited utilization of autologous blood transfusion is lack of an aggressive marketing strategy. In 1971, Milles et al wrote, "The failure of the medical profession to embrace this answer to the dangers of homologous blood . . . is due . . . to above all, a lack of repetitious advertising of the only perfect blood for the recipient."[19] This is due, in part, to a legitimate fear by organized blood banking establishments that this procedure might disrupt or dangerously jeopardize the homologous blood supply.[20,21] While such concerns are valid and critically important, preliminary data from St. Cloud Hospital suggests that a well conceived and formulated autologous blood transfusion program can successfully operate without threatening or even substantially competing with the preexisting homologous blood transfusion program.[22]

Depending on the circumstances, autologous blood may be procured either from an in-house, hospital-based autologous blood transfusion program or from the regional blood supplier. With either method it is important that the hospital and regional blood supplier communicate and cooperate with each other. The autologous blood transfusion program at St. Cloud is hospital-based. We began our program in 1983, before it was common for local regional blood suppliers to routinely provide this service. In addition, geographically we are located about 80 miles from our regional blood supplier. It is, therefore, more convenient for our patients to donate at our hospital rather than making long trips to the regional blood center. Our program was developed only after 1) careful review of the scientific knowledge available to justify establishing such a program; 2) analysis of our potential, applicable patient base; 3) discussions, communications and cooperation with our regional, homologous blood supplier; 4) analysis of cost factors; 5) insuring the existence of facilities and trained personnel to accommodate this program; 6) providing appropriate education to the clinicians and the community; 7) communicating with third party payors; and 8) developing a workable protocol. The continued success of our program is due to the enthusiastic support of the clinicians and their patients.

As interest in autologous blood transfusion grows, and especially as regional blood centers become more interested in providing this service, hospitals in major metropolitan areas with close physical access to a regional blood center may want to ask the regional blood center to provide this service for them. This choice should be made only when it is clear that the regional blood supplier is committed to the concept of autologous blood transfusion and can provide the same level and quality of service as provided by an in-house program. Furthermore, the regional blood center may not be able to provide this service for hospitals geographically distant from the blood center. In such cases it is nonetheless important that the hospital and blood center closely cooperate in the implementation of such a program. Such cooperation will help to insure a healthy balance between autologous and homologous blood (and may actually increase the donor blood supply by recruiting autologous donors who would not normally be a part of the homologous pool).

In summary, interest in and implementation of autologous blood transfusion programs is growing rapidly. Analysis of local needs, careful planning and cooperating with the regional blood center are critical parameters in the establishment of such programs. Only in this spirit will autologous blood transfusion become a complementary not competitive modality to homologous transfusion and reach its maximum potential.

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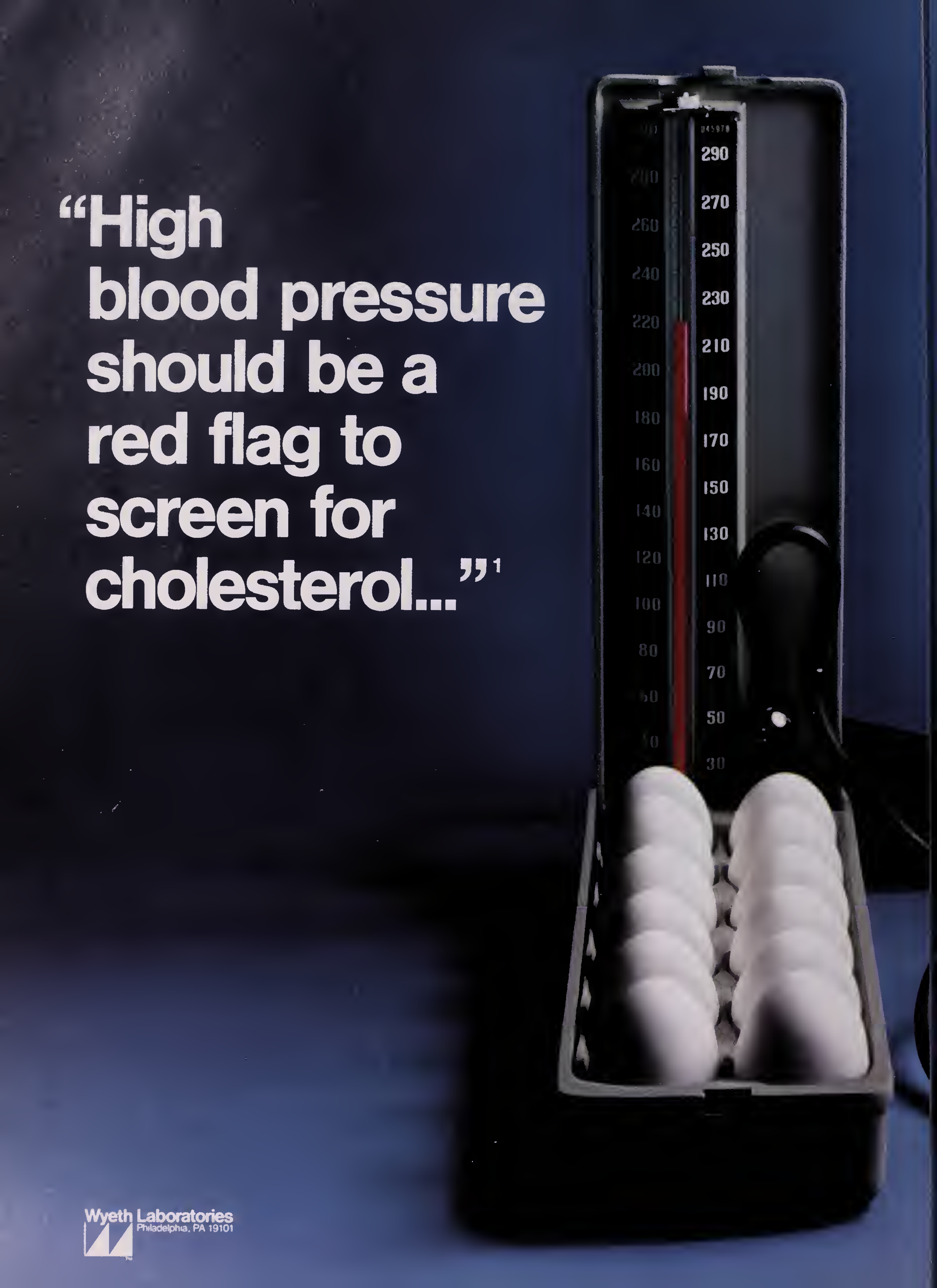
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See important information on following page.

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that does not increase cholesterol

Brief Summary

Before prescribing, consult the complete package circular.

Indications and Usage: Treatment of hypertension, alone or in combination with a thiazide diuretic

Contraindication: Known sensitivity to the drug

Precautions: 1 Sedation. Causes sedation or drowsiness in a large fraction of patients When used with centrally active depressants, e g., phenothiazines, barbiturates and benzodiazepines, consider potential for additive sedative effects 2 Patients with vascular insufficiency Like other antihypertensives use with caution in severe coronary insufficiency, recent myocardial infarction, cerebrovascular disease, or severe hepatic or renal failure 3 Rebound Sudden cessation of therapy with central alpha agonists like **Wytensin** may rarely result in "overshoot" hypertension and more commonly produces increase in serum catecholamines and subjective symptomatology.

INFORMATION FOR PATIENTS. Advise patients on **Wytensin** to exercise caution when operating dangerous machinery or motor vehicles until it is determined they do not become drowsy or dizzy Warn patients that tolerance for alcohol and other CNS depressants may be diminished. Advise patients not to discontinue therapy abruptly

LAB TESTS In clinical trials, no clinically significant lab test abnormalities were identified during acute or chronic therapy. Tests included CBC, urinalysis, electrolytes, SGOT, bilirubin, alkaline phosphatase, uric acid, BUN, creatinine, glucose, calcium, phosphorus, total protein, and Coombs' test During long-term use there was small decrease in serum cholesterol and total triglycerides without change in high-density lipoprotein fraction In rare instances occasional nonprogressive increase in liver enzymes was observed, but no clinical evidence of hepatic disease

DRUG INTERACTIONS **Wytensin** was not demonstrated to cause drug interactions when given with other drugs, e g , digitalis, diuretics, analgesics, anxiolytics, and antiinflammatory or antiinfective agents, in clinical trials However, potential for increased sedation when given concomitantly with CNS depressants should be noted

DRUG/LAB TEST INTERACTIONS· No lab test abnormalities were identified with **Wytensin** use

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY No evidence of carcinogenic potential emerged in rats during a two-year oral study with **Wytensin** at up to 9 5 mg/kg/day, i e , about 10 times maximum recommended human dose In the Salmonella microsome mutagenicity (Ames) test system, **Wytensin** at 200-500 mcg per plate or at 30-50 mcg/ml in suspension gave dose-related increases in number of mutants in one (TA 1537) of five *Salmonella typhimurium* strains with or without inclusion of rat liver microsomes No mutagenic activity was seen at doses up to those which inhibit growth in the eukaryotic microorganism, *Schizosaccharomyces pombe*, or in Chinese hamster ovary cells at doses up to those lethal to the cells in culture. In another eukaryotic system, *Saccharomyces cerevisiae*, **Wytensin** produced no activity in an assay measuring induction of repairable DNA damage Reproductive studies showed a decreased pregnancy rate in rats given high oral doses (9 6 mg/kg), suggesting impairment of fertility Fertility of treated males (9 6 mg/kg) may also have been affected, as suggested by decreased pregnancy rate of mates, even though females received drug only during last third of pregnancy

PREGNANCY Pregnancy Category C WYTENSIN® MAY HAVE ADVERSE EFFECTS ON FETUS WHEN ADMINISTERED TO PREGNANT WOMEN A teratology study in mice indicated possible increase in skeletal abnormalities when **Wytensin** is given orally at doses 3 to 6 times maximum recommended human dose of 1.0 mg/kg These abnormalities, principally costal and vertebral, were not noted in similar studies in rats and rabbits However, increased fetal loss has been observed after oral **Wytensin** given to pregnant rats (14 mg/kg) and rabbits (20 mg/kg). Reproductive studies in rats have shown slightly decreased live-birth indices, decreased fetal survival rate, and decreased pup body weight at oral doses of 6 4 and 9 6 mg/kg There are no adequate, well-controlled studies in pregnant women. **Wytensin** should be used during pregnancy only if potential benefit justifies potential risk to fetus

NURSING MOTHERS· Because no information is available on **Wytensin** excretion in human milk it should not be given to nursing mothers.

PEDIATRIC USE. Safety and effectiveness in children less than 12 years of age have not been demonstrated, use in this age group cannot be recommended

Adverse Reactions: Incidence of adverse effects was ascertained from controlled clinical studies in U S and is based on data from 859 patients on **Wytensin** for up to 3 years. There is some evidence that side effects are dose-related. Following table shows incidence of adverse effects in at least 5% of patients in study comparing **Wytensin** to placebo, at starting dose of 8 mg b i d

Adverse Effect	Placebo (%) n = 102	**Wytensin** (%) n = 109
Dry mouth	7	28
Drowsiness or sedation	12	39
Dizziness	7	17
Weakness	7	10
Headache	6	5

In other controlled clinical trials at starting dose of 16 mg/day in 476 patients, incidence of dry mouth was slightly higher (38%) and dizziness was slightly lower (12%), but incidence of most frequent adverse effects was similar to placebo-controlled trial Although these side effects were not serious, they led to discontinuation of treatment about 15% of the time In more recent studies using an initial dose of 8 mg/day in 274 patients, incidence of drowsiness or sedation was lower, about 20% Other adverse effects reported during clinical trials but not clearly distinguishable from placebo effects and occurring with frequency of 3% or less Cardiovascular—chest pain, edema arrhythmias, palpitations Gastrointestinal—nausea, epigastric pain, diarrhea, vomiting, constipation, abdominal discomfort Central nervous system—anxiety, ataxia, depression, sleep disturbances. ENT disorders—nasal congestion Eye disorders—blurring of vision Musculoskeletal—aches in extremities, muscle aches Respiratory—dyspnea Dermatologic—rash, pruritus Urogenital—urinary frequency, disturbances of sexual function Other—gynecomastia taste disorders

Drug Abuse and Dependence: No dependence or abuse has been reported

Overdosage: Accidental ingestion caused hypotension, somnolence, lethargy, irritability, miosis, and bradycardia in two children aged one and three years Gastric lavage and pressor substances, fluids, and oral activated charcoal resulted in complete and uneventful recovery within 12 hours in both Since experience with accidental overdosage is limited, suggested treatment is mainly supportive while drug is being eliminated and until patient is no longer symptomatic Vital signs and fluid balance should be carefully monitored Adequate airway should be maintained and, if indicated, assisted respiration instituted No data are available on **Wytensin** dialyzability

Dosage and Administration: Individualize dosage A starting dose of 4 mg b.i.d is recommended, whether used alone or with a thiazide diuretic Dosage may be increased in increments of 4 to 8 mg/day every one to two weeks, depending on response Maximum dose studied has been 32 mg b.i.d , but doses this high are rarely needed.

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8. I didn't sign up.
9. I'm going out of town.
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Recovery from Severe Idiopathic Aplastic Pancytopenia following Antithymocyte Globulin Therapy

AZAM ANSARI, M.D.* and MONNA GROTTE, M.D.*

Severe idiopathic aplastic pancytopenia developed in a 64-year-old woman who remained gravely ill for 12 weeks (critically ill for four weeks) despite all supportive management. She made a dramatic and sustained recovery following the use of antithymocyte globulin (20 mg/kg for eight consecutive days) administered intravenously. Indication and contraindication for use of antithymocyte globulin under similar circumstances are outlined and its possible mode of action is discussed. Bone marrow transplantation and antithymocyte globulin therapy are compared and contrasted relative to their practicality, effectiveness and cost.

Aplastic anemia was first described by Ehrlich in 1888.[1] Camitta, et al.[2] have suggested that the term "aplastic pancytopenia" (AP) would be more accurate and descriptive than aplastic anemia (AN). We fully agree and therefore have adopted it in this communication. AP is a serious and often life-threatening hematological disorder which is characterized by peripheral blood pancytopenia, variable bone-marrow hypocellularity and the absence of an underlying malignant or myeloproliferative disease. In 40-70% of the patients, the cause remains unknown (idiopathic). Several pathogenetic mechanisms have been postulated. Most data suggests that idiopathic aplastic pancytopenia (IAP) usually results from the absence or defects of the hemopoietic stem cells, abnormalities of the bone marrow microenvironment, ineffective cell-to-cell interactions, and/or an immune disorder involving T- and B-lymphocytes.[3] The prognosis for approximately 5,000 individuals who develop this disease remains grim despite some recent advances in the management. Twenty-five percent die within the first three months after the onset of symptoms and 50% within the first year, the five-year mortality being 70%.[4] Spontaneous remission rate is extremely small.

Bone marrow transplantation (BMT) from identical human-leukocyte-antigen (HLA) sibling donors has improved the prognosis of patients with IAP and remains the preferred mode of treatment under age 30. However, currently there is no proven effective therapy for such patients who are either not suitable candidates for BMT or cannot afford it because of the prohibitive cost and prolonged hospitalization. Recently, we had the opportunity to successfully manage a patient who according to the international aplastic anemia study group[5] had severe IAP but was not a suitable candidate for BMT and remained critically ill despite all possible supportive management. No one involved in her medical care, i.e. physicians, nurses, pathologist, blood bank directors, and family members, expected that she would successfully recover and leave the hospital to lead a meaningful life.

Patient Report

A 64-year-old woman was admitted to the hospital for evaluation and treatment of severe pancytopenia. She was not taking any drugs nor did she recall being exposed to any chemical recently. She developed spontaneous petechiae, epistaxis, and ecchymoses two months prior to admission for which she had received random platelet transfusion at another institution. On admission, hemoglobin was 9.0 gm%, corrected reticulocyte count was 0.5%, white blood cell count was 2,600/cmm, total PMNs were 234/cmm and platelet count was 2,000/cmm. Core bone marrow biopsy showed marked degree of hypocellularity. The intertrabecular marrow space was occupied predominantly by the adipose tissue with scattered

TABLE 1

International Aplastic Anemia Study Group Criteria for Severe Aplastic Pancytopenia

Site	Proposed Criteria *Findings*	Patient Data *Findings*
Blood	Neutrophils <500/cmm	Neutrophils 237/cmm
	Platelets <20,000/cmm	Platelets 2,000/cmm
	Reticulocytes <1% (corrected for hematocrit)	Reticulocytes 0.5% (corrected for % of RBC)
Marrow	Severe hypocellularity or moderate hypocellularity	Severe hypocellularity (30% of residual cells being hematopoietic)

Presented in part at the joint meeting of American College of Physicians (Minnesota Chapter) and Minnesota Society of Internal Medicine, November 16-17, 1984 in Minneapolis, Minnesota.

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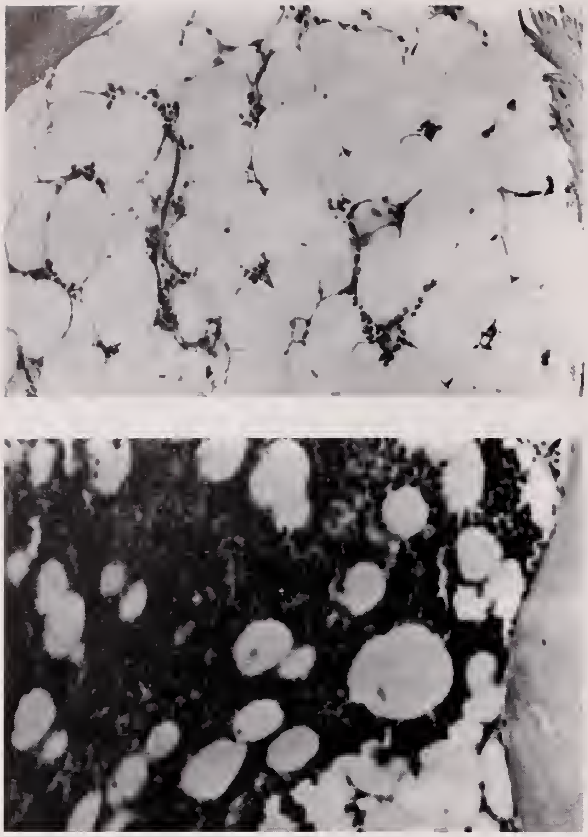

Figure 1 - Core biopsy of the bone marrow from identical sites. (A) Before. (B) After eight weeks of antithymocyte globulin therapy. There is significant improvement in the hypocellularity and fatty replacement noted prior to the treatment. Active erythropoiesis, granulopoiesis and occasional megakaryocytes present. (Hematoxylin and Eosin x40)

lymphocytes, plasma cells and macrophages (Figure 1(A)). These abnormalities fulfill criteria for severe AP devised by the international aplastic anemia study group (Table 1). Chest Xray, EKG, serum electrolytes, and SMA_{12} were all normal. Screening test for paroxysmal nocturnal hemoglobinuria, EB virus antibody, HBSAg, and antibody were all negative.

Initially patient was treated in isolation and blood component therapy was given as the necessity arose. She received trials of oral corticosteroids (Prednisone 1.0 mg/kg/day) and androgen (Oxymethalone 3-5 mg/kg/day) for two weeks, but because of the lack of any response, these agents were withdrawn. Because of widespread recurrent hemorrhages, bacteremia, pneumonia, and continued deterioration in clinical state as well as hematological parameters (WBC 900/cmm, platelets 1,000/cm) it was decided to institute immunotherapy utilizing antithymocyte globulin (ATGAM - Upjohn) in addition to other supportive management. On account of her age, previous multiple blood transfusions and inability to afford the cost, she was not considered a suitable candidate for BMT.

After obtaining an informed consent, hypersensitivity to ATGAM was tested by the skin test. In its absence, ATGAM was administered intravenously (20 mg/kg of body weight/day diluted in 500 cc of normal saline and infused over four hours for eight consecutive days) while continuing the supportive management. Patient was premedicated with acetaminophen 650 mg orally and diphenhydramine 50 mg IV thirty minutes before each infusion. Because thrombocytopenia may be worsened by ATGAM, concurrent random platelet transfusions were given during the course of treatment, but not administered thereafter. The patient developed right infranuclear facial paralysis a day after the treatment was completed. This was the only manifestation of the serum sickness following the ATGAM therapy. Following 40 mg of Prednisone per day for one week and daily facial strengthening exercises, the facial nerve function was restored to normal in four weeks. During ATGAM therapy, the patient began to improve. The improvement was initially signaled by cessation of hemorrhages in fundi, and an increase in platelet count. By the end of the third week following ATGAM, there was a rise in the reticulocyte count, red blood cell count, and hemoglobin. By the end of the fourth week, there was an increase in the white blood count. Concurrent increase in all three cellular elements was obvious between 20th and 27th weeks following ATGAM therapy (Figure 2).

Eight weeks following the ATGAM treatment, another core bone marrow biopsy taken from identical site indicated significant improvement in the previously noted hypocellularity and fatty infil-

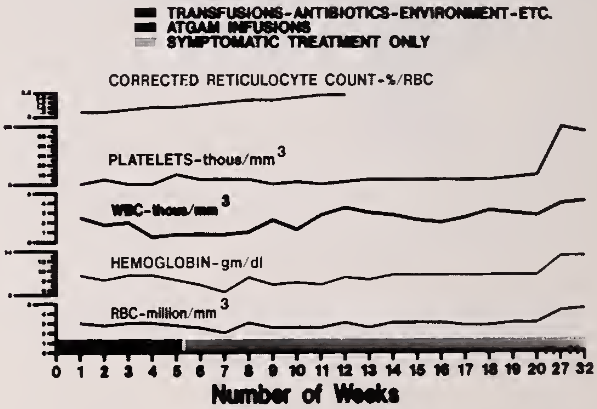

Figure 2 - Hematologic data before, during and following antithymocyte globulin therapy. There is slow but definite improvement in all five parameters beginning at three weeks and reaching peak at 20 weeks following antithymocyte globulin infusion.

tration. There was now evidence of active erythropoiesis and granulopoiesis. Occasional megakaryocytes were also seen (Figure 1(B)). Hemoglobin rose to 13.4 gm%, WBC to 4,200/cmm, PMNs increased to 2,730/cmm, and platelets increased to 65,000 cmm between 20th and 27th weeks. The patient is now 24-months post ATGAM therapy sustaining her above-mentioned hemogram and leading a usual life with occasional epistaxis which requires local measures for control. She has not required any further blood component therapy and/or hospitalization during this interval.

Comments

Allogeneic BMT is currently considered by many to be the treatment of choice for patients with severe IAP who have an HLA identical sibling donor. Bortin, et al.[6] reported a one-year survival rate of 44% (64 out of 144) among such patients. Among these survivors, the primary disease was cured in 90% and improved in 10%.

Najean[7] and his long-term follow-up of 137 patients with IAP who received androgen therapy reported 16% mortality during one to eight years follow-up. Relapses were common, occurring in 50%, and occurred between the third and fourth month after androgen withdrawal first began. The possibility of complete cure of AP by this modality was considered questionable.

Recently there has been considerable interest in the role of the immune system in the regulation of normal hematopoiesis and the potential role of immune suppression of hematopoiesis in the pathogenesis of IAP. Several studies have presented in vitro data compatible with the concept of lymphocyte mediated or antibody mediated, suppression of hematopoiesis as a cause of IAP in some patients.

TABLE 2

Indications and Contraindications for the Use of Antithymocyte Globulin (ATGAM) in Patients with Idiopathic Aplastic Pancytopenia

A. Indications.
1. Age over 30.
2. Unavailability of identical human-leukocyte-antigen related donor.
3. Unable to afford bone marrow transplantation because of the cost.
4. Lack of improvement following supportive treatment.

B. Contraindications.
1. Previous documented history of hypersensitivity to any equine serum.
2. Systemic reaction to antithymocyte globulin skin test.
3. Inability to obtain an informed consent.

Because of these data, several investigators have evaluated ATGAM or antilymphocyte globulin as potential therapeutic modalities. In several small uncontrolled studies, 30-65% of the patients with IAP given either treatment recovered. Other investigators have reported lower response rate, and the efficacy of ATGAM remained controversial until a prospective randomized trial reported by Champlin, et al.[8] In this study, 11 of 21 patients initially randomized to receive ATGAM had sustained improvement in hematopoiesis within three months of treatment, whereas none of the 21 control patients who received only supportive care improved. Subsequently, six of the 12 control patients who received ATGAM improved. Most of the responders had gradual improvement in hema-

TABLE 3

Comparison of the Bone Marrow Transplantation and Antithymocyte Globulin Therapy in the Management of Patients with Idiopathic Aplastic Pancytopenia

	Bone Marrow Transplantation	*Antithymocyte Globulin*
Age limit	<30 years	None, but usually
Availability of HLA matched sibling donor	Must	Not needed
Prior preparation	Laborious and complicated	Simple
Technique of administration	Relatively involved	Simple
Response rate	44%	50%
Cure rate in responders	Complete in 90%	Incomplete in most
Graft vs. Host reaction	Common	Rare
Prognosis altered by prior blood transfusions	Yes	No
Duration of hospitalization	Prolonged (60 - 100 days)	Short (30 days)
Total approximate cost (excluding follow-ups)	$90,000 - $100,000	$15,000 - $20,000

topoiesis, usually within three months of starting treatment, but none recovered completely normal peripheral blood counts. The severity of the bone marrow failure, age, cause of aplastic anemia, and previous transfusion therapy had no apparent bearing on the final outcome. The interval from diagnosis to ATGAM treatment correlated inversely with the chance of successful response. Our observations obtained during the management and the care of the patient described above support these impressions. Therefore, it is suggested that ATGAM can be cost effective (approximately $15,000 - $20,000) in improving hematopoiesis in some patients with IAP who are critically ill and yet either not suitable candidates for BMT or can't afford it because of prohibitive cost (approximately $90,000 - $100,000). Further comparisons of these two modes of treatment are provided in Table 3.

Most investigators ascribe the beneficial effects of ATGAM to its immunosuppressive activity. However, convincing data supporting this hypothesis are lacking and other mechanisms must be considered. It may stimulate hematopoiesis by altering the balance of lymphoid or nonlymphoid regulatory cells or by some other as yet unknown mechanism. Experimental and clinical studies to unravel the real mechanism responsible are urgently needed.

One could argue that in the absence of a control, our patient underwent a spontaneous remission and the improvement fortuitously coincided with the ATGAM therapy. While we cannot exclude this possibility entirely, we believe that this patient acted as her own control for three months during which there was no improvement despite full supportive management, and given the severity and numerous critical complications, she was destined for demise in the opinion of many who were involved in her medical care.

Summary

A 64-year-old woman with severe idiopathic aplastic pancytopenia who was not a candidate for bone marrow transplantation and remained ill for 12 weeks (critically ill for four weeks) despite all supportive treatment, made a sustained recovery following the use of antithymocyte globulin (20 mg/kg for eight consecutive days) administered intravenously. The role and mode of action of this emerging therapeutic agent in reversing this serious and often life-threatening disease remains unclear. Possibilities are discussed. Indications and contraindications for the future use of antithymocyte globulin are outlined. Bone marrow transplantation and antithymocyte globulin therapy are compared and contrasted relative to their practicality, effectiveness and costs.

Addendum

Since the submission of the original manuscript 14 months ago, the patient has continued to do well and leads a normal life without any petechiae, recurrent epistaxis or hemorrhages. She has not required any blood component therapy. Her current hemoglobin is 13.0 gm/dl, hematocrit 40%, WBC count 4100/cm and platelets are 84,000/cm. She is now past 48 months following antithymocyte globulin therapy.

Acknowledgments

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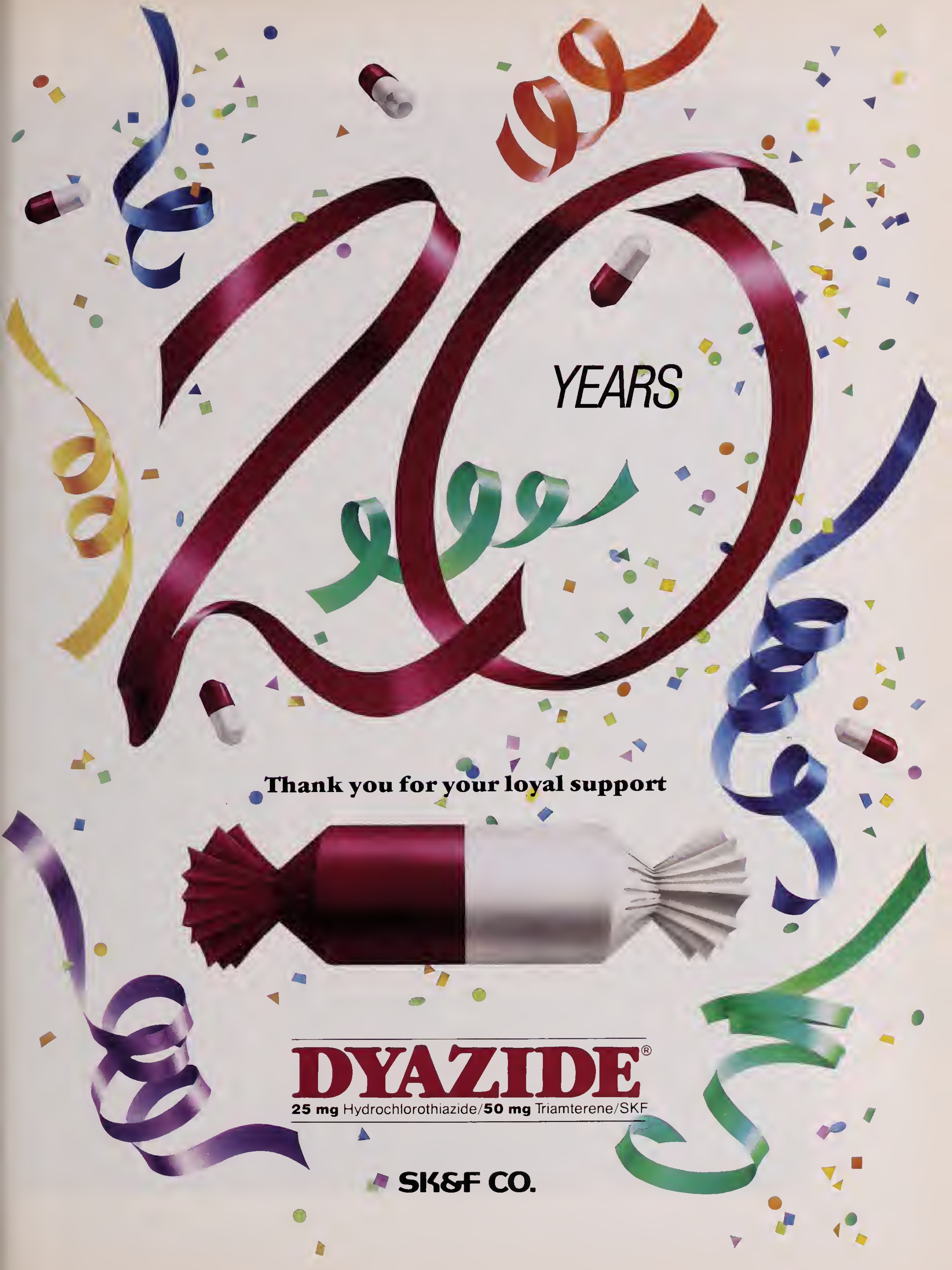

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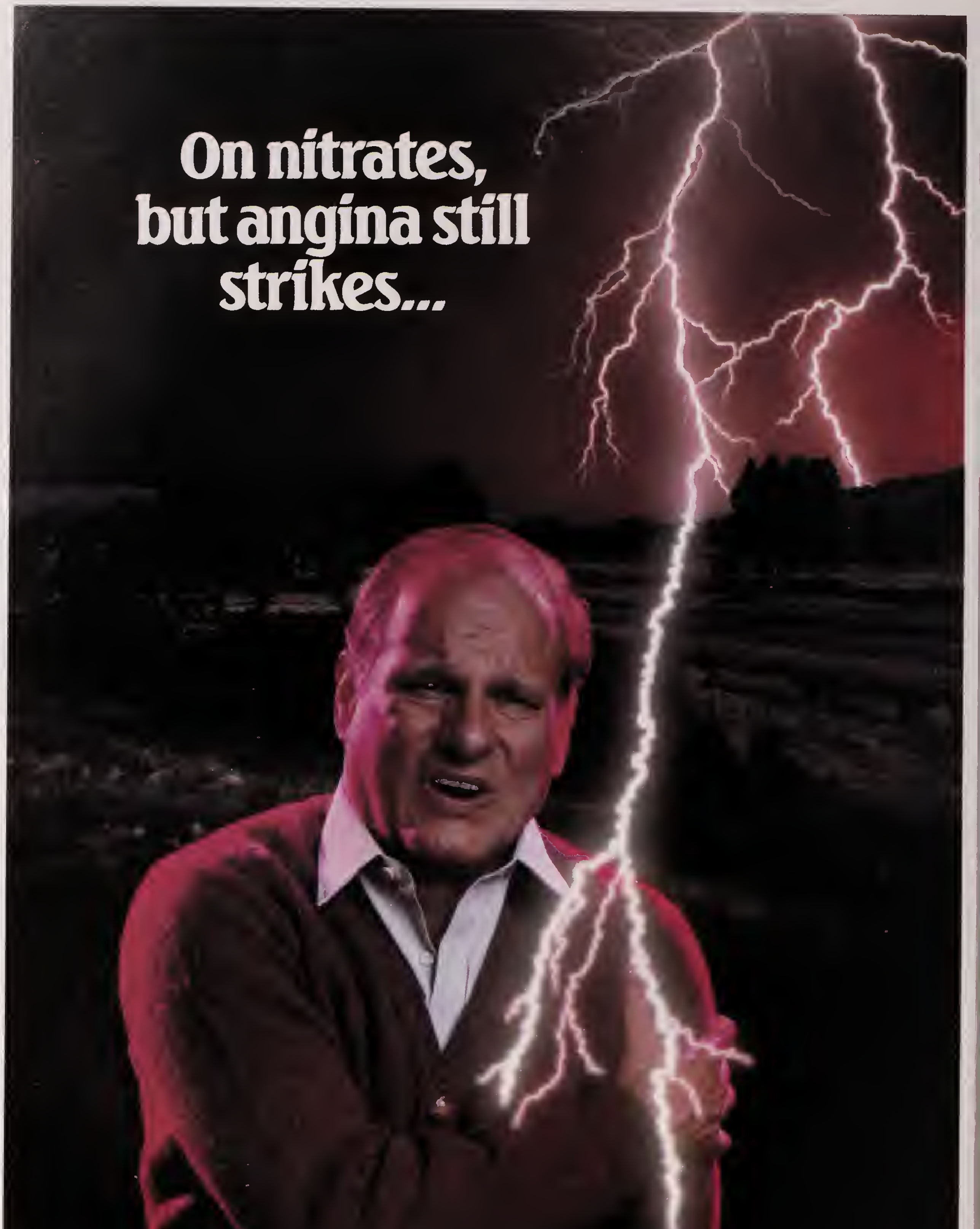
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Elevations of transaminases with and without concomitant elevations in alkaline phosphatase and bilirubin have been reported. Such elevations may disappear even with continued treatment; however, four cases of hepatocellular injury by verapamil have been proven by rechallenge. Periodic monitoring of liver function is prudent during verapamil therapy. Patients with atrial flutter or fibrillation and an accessory AV pathway (e.g. W-P-W or L-G-L syndromes) may develop increased antegrade conduction across the aberrant pathway bypassing the AV node, producing a very rapid ventricular response after receiving ISOPTIN (or digitalis). Treatment is usually D.C.-cardioversion, which has been used safely and effectively after ISOPTIN. Because of verapamil's effect on AV conduction and the SA node, 1° AV block and transient bradycardia may occur. High grade block, however, has been infrequently observed. Marked 1° or progressive 2° or 3° AV block requires a dosage reduction or, rarely, discontinuation and institution of appropriate therapy depending upon the clinical situation. Patients with hypertrophic cardiomyopathy (IHSS) received verapamil in doses up to 720 mg/day. It must be appreciated that this group of patients had a serious disease with a high mortality rate and that most were refractory or intolerant to propranolol. A variety of serious adverse effects were seen in this group of patients including sinus bradycardia, 2° AV block, sinus arrest, pulmonary edema and/or severe hypotension. Most adverse effects responded well to dose reduction and only rarely was verapamil discontinued. **Precautions:** ISOPTIN should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of excessive pharmacologic effects. Studies in a small number of patients suggest that concomitant use of ISOPTIN and beta blockers may be beneficial in patients with chronic stable angina. Combined therapy can also have adverse effects on cardiac function. Therefore, until further studies are completed, ISOPTIN should be used alone, if possible. If combined therapy is used, close surveillance of vital signs and clinical status should be carried out. Combined therapy with ISOPTIN and propranolol should usually be avoided in patients with AV conduction abnormalities and/or depressed left ventricular function. Chronic ISOPTIN treatment increases serum digoxin levels by 50% to 70% during the first week of therapy, which can result in digitalis toxicity. The digoxin dose should be reduced when ISOPTIN is given, and the patients should be carefully monitored to avoid over- or under-digitalization. ISOPTIN may have an additive effect on lowering blood pressure in patients receiving oral antihypertensive agents. Disopyramide should not be given within 48 hours before or 24 hours after ISOPTIN administration. Until further data are obtained, combined ISOPTIN and quinidine therapy in patients with hypertrophic cardiomyopathy should probably be avoided, since significant hypotension may result. Clinical experience with the concomitant use of ISOPTIN and short- and long-acting nitrates suggest beneficial interaction without undesirable drug interactions. Adequate animal carcinogenicity studies have not been performed. One study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. *Pregnancy Category C*: There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor and delivery only if clearly needed. It is not known whether verapamil is excreted in breast milk; therefore, nursing should be discontinued during ISOPTIN use. **Adverse Reactions:** Hypotension (2.9%), peripheral edema (1.7%), AV block: 3rd degree (0.8%), bradycardia: HR < 50/min (1.1%), CHF or pulmonary edema (0.9%), dizziness (3.6%), headache (1.8%), fatigue (1.1%), constipation (6.3%), nausea (1.6%), elevations of liver enzymes have been reported. (See *Warnings.*) The following reactions, reported in less than 0.5%, occurred under circumstances where a causal relationship is not certain: ecchymosis, bruising, gynecomastia, psychotic symptoms, confusion, paresthesia, insomnia, somnolence, equilibrium disorder, blurred vision, syncope, muscle cramp, shakiness, claudication, hair loss, macules, spotty menstruation. **How Supplied:** ISOPTIN (verapamil HCl) is supplied in round, scored, film-coated tablets containing either 80 mg or 120 mg of verapamil hydrochloride and embossed with "ISOPTIN 80" or "ISOPTIN 120" on one side and with "KNOLL" on the reverse side. Revised August, 1984. 2385

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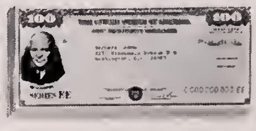

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Rheumatology Corner

Lyme Disease

PETER A. SCHLESINGER, M.D.*

There are few human diseases about which we have witnessed the knowledge explosion that has occurred in the case of Lyme disease. First described in Connecticut in 1975, as an unusual cluster of arthritis,[1,2] Lyme disease now has a known natural history, cause, and treatment. The etiologic agent, the spirochete Borrelia burgdorferi, is transmitted by Ixodes dammini or related ixodid ticks.[3] The geographic distribution of Lyme disease is widespread and includes central Minnesota and northwestern Wisconsin.[4] Whether the result of increased physician awareness or of an actual increase in incidence, the number of reported cases of Lyme disease has risen dramatically in recent years; 1984 saw 96 cases in Minnesota.[5]

Clinical Manifestations

The clinical manifestations of Lyme disease can be divided into three stages: cutaneous (stage 1); cardiac or neurologic (stage 2); and arthritic (stage 3.)[1,2] Disease onset is between April and November, with the largest number of cases occurring in June and July. In stage 1, a characteristic skin lesion, erythema chronicum migrans, develops at the site of a tick bite, between 3 and 32 days (median, 7 days) after the bite.[6] However, only about one third of the patients recall a tick bite. Erythema chronicum migrans begins as a small red macule or papule which expands to become annular (median diameter, 15 cm). The edge of a lesion usually remains bright red; the center often shows clearing but may become indurated, vesicular, or necrotic. The lesions are hot to the touch and may cause burning, itching, or painful sensations. Many patients develop secondary skin lesions, similar to, but usually smaller than the primary lesion, at distant sites. Untreated erythema chronicum migrans usually resolves over days to weeks. Recurrences are occasionally noted. Stage 1 disease is often accompanied by systemic signs and symptoms.[6] Complaints of fever, malaise, arthralgias, myalgias, and sore throat suggest a viral illness. Lymphadenopathy, conjunctivitis, and hepatosplenomegaly are sometimes seen. Certain symptoms, such as headache, stiff neck, and photophobia, suggest meningeal irritation.

Cardiac and Neurologic Sequelae

A minority of patients go on to experience self-limited cardiac or neurologic sequelae (stage 2) weeks to months after the initial illness.[1,2] The most common form of cardiac involvement is atrioventricular block of fluctuating degree, sometimes progressing to transient complete heart block.[7] Myopericarditis, usually mild, is also seen.[7] Neurologic abnormalities include meningoencephalitis, cranial neuritis, and motor and sensory radiculoneuritis.[8] Isolated facial (Bell's) palsy, unilateral or bilateral, is fairly common.[8]

Stage 3 Disease

Stage 3 disease occurs later still and consists of attacks of frank arthritis, usually oligoarticular, lasting about one week.[1,2] The knee is the most frequently affected joint. Arthritis is the most common later manifestation of Lyme disease, occurring in about 60% of untreated patients, and recurrent attacks at variable intervals are often seen. A chronic erosive synovitis of the knee has been described, with some patients developing Baker's cysts or requiring synovectomy.[2]

Diagnosis

The diagnosis of Lyme disease is predominantly clinical. The presence of erythema chronicum migrans is virtually pathognomonic.[2] However, in patients presenting with stage 2 or 3 disease, the occurrence of erythema chronicum migrans may have to be elicited historically. The situation is further complicated by the fact that stage 2 or 3 disease can occur in patients who never experienced cutaneous lesions.[2] Common but non-specific laboratory abnormalities during stage 1 include an elevated erythrocyte sedimentation rate, increased aspartate transaminase (SGOT), and elevated serum IgM.[6] Synovial fluid analysis during acute arthritis usually shows inflammatory fluid.[2] A specific indirect immunofluorescence test for antibodies to Borrelia burgdorferi exists; however, its utility is hampered by limited availability.

Pathogenesis

The pathogenesis of Lyme disease is reasonably well understood at present. The causative spirochete is injected into the skin at the site of the tick bite.[3] From there it may spread hematogenously to distant sites. The spirochete has been cultured from skin, blood, and cerebrospinal fluid,[3] and has been demonstrated by direct staining in synovial lesions.[9] Recently, transplacental transmission of Borrelia burgdorferi has been documented.[10] Biopsy specimens of skin or synovium reveal a mononuclear cell infiltrate without necrosis or granuloma formation.[1] It has been known for some years that patients with the B-cell alloantigen HLA-DR2 are at higher risk for the development of severe stage 2 or 3 disease. This fact, combined with the knowledge that circulating immune complexes are demonstrable in the majority of patients with Lyme disease, led to the supposition that late disease activity is due to a self-perpetuating host immune response to the spirochete. However, the demonstration of spirochetes in distant sites[3,9] and the frequent responsiveness of the late disease to antibiotics[8,11] (see below) imply that small numbers of viable spirochetes may persist for long periods.

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Treatment

The treatment of Lyme disease consists principally of antibiotic therapy. In stage 1 disease, oral tetracycline, 250 mg four times a day for 10 to 20 days, shortens the course of erythema chronicum migrans and usually prevents major late disease manifestations.[2,12] Oral penicillin or erythromycin is also effective but not as consistently so.[2,12] For neurologic complications other than facial palsy, intravenous penicillin G, 20 million U/day in divided doses for 10 days, hastens resolution.[2,8] Tetracycline, 2 g/day in divided doses for 30 days, is an alternative in the case of penicillin allergy.[8] Patients with facial palsy alone need receive only oral antibiotics as in stage 1; a short course of prednisone is given if the palsy is of less than 24 hours' duration at the time the patient is seen.[8] Cardiac involvement does not require additional antibiotic therapy. However, severe conduction disturbances may benefit from a course of prednisone; temporary pacing may be indicated. Late attacks of arthritis often, but not invariably, respond to parenteral penicillin, although the optimal regimen remains to be defined.[2,11] Aspirin or other nonsteroidal anti-inflammatory agents usually provide symptomatic relief. Intraarticular steroids may be helpful for chronic synovitis but should not be given at or near the time of parenteral penicillin.[11]

Conclusion

Given its eminent responsiveness to antibiotics in stage 1, the manifestations of Lyme disease should be familiar to primary care physicians practicing in endemic areas. Treatment should be initiated on the basis of appropriate clinical suspicion, since a rapid diagnostic test is not available. Pregnant women should be treated especially promptly (with penicillin, or if allergic, erythromycin) and should probably avoid tick exposure in endemic areas. Prevention may become a viable modality if tick sprays are shown to be effective in preventing bites.

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THOMAS E. KOTTKE, M.D., MSPH*

Because employees who smoke influence patients to smoke, optimal medical care means treatment by non-smokers in a smoke-free environment. Smoking is not expressly protected under anti-discrimination laws, and it is a habit which interferes with an employee's ability to perform his or her job. Hiring only non-smokers is, therefore, legal.

As the problems associated with smoking and exposure to tobacco smoker become clearer, health care institutions are adopting a policy of smoke-free facilities and of hiring only non-smokers. Since 1974 the Laboratory of Physiological Hygiene, now incorporated into the University of Minnesota's Division of Epidemiology, has not allowed smoking in its facility and has not hired smokers for positions requiring contact with the public. MedCenters Health Plan has had a policy of not hiring smokers since July, 1984. Mutual Services Insurance and Aid Association for Lutherans, among other insurance companies, do not allow smoking in their offices. Section 27-40.1 and 51-122 of the Code of Virginia indicate that the death, total or partial disability of a deputy sheriff, firefighter, or police officer as the result of a respiratory disease, hypertension, or heart disease shall be presumed to have been suffered in the line of duty unless preponderant evidence can be presented to the contrary.[1] Fairfax County, Virginia has concluded that it is in the best interest of the county to limit liability by not hiring smokers. It has hired only non-smokers since March, 1984 (Figure 1).

Others have questioned whether such policies violate anti-discrimination laws. Title VII of the Civil Rights Act of 1964[2] and other laws explicitly prohibit discriminatory hiring on the basis of race, creed, color, sex, age, or ethnic status, but not to the ability to perform the required job task, discriminatory hiring is also illegal. For example, requiring a college education of a janitor in an attempt to avoid hiring minorities is illegal.

In the same survey we reported in part in Minnesota Medicine[3], we found that about 40% of our patients agree that smoking by employees leads them to believe that smoking is not dangerous. Others[4] have found that a smoker who appears to be a hospital employee stimulates smoking among patients and visitors in a hospital waiting room. These data demonstrate that health professionals or employees who smoke adversely affect the health behavior and health status of the patient.

Legal opinions offered to the American Lung Association[5] suggest that a labor union may attempt to file a unilateral change of working conditions grievance if employees are denied the right to smoke, but the majority of lawyers were of the opinion that this grievance would be sustained only if the right to smoke were specifically mentioned in the labor contract. The courts have also ruled that a worker may not bargain away legally mandated safety standards in return for higher wages.[6] Therefore, it is improbable that the courts would defend the worker's right to exposure to a hazard on the worksite, especially when that hazard, like smoking, constitutes a hazard to other employees.

Summary

Hiring only non-smokers is legal under Federal anti-discrimination law because smoking is not explicity mentioned in the law, and smoking interferes with the employee's job performance. In this respect, health care providers are free to pursue optimal health care: Care by non-smoking providers in a smoke-free environment.

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For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

JUNE, 1986

13-15 **Minnesota Thoracic Society Annual Scientific Meeting** Minnesota Thoracic Society, Madden's Resort, Brainerd, Minnesota. CONTACT: Scott F. Davies, M.D, Department of Medicine, Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, Minnesota 55413. 612/347-2705.

13-14 **Hospital Nutrition Support** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 2023 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

18 **Target Organ Damage** CME, Medical School, University of Minnesota; Sheraton Miday Hotel, 400 Hamline Avenue North, St. Paul, Minnesota 55104; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/626-5525.

18-21 **50th Annual Surgery Course: Trauma & Critical Care Surgery** CME, Medical School, University of Minnesota, Willey Hall and Amfac Hotal, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

21 **Minnesota Obstetrical and Gynecological Society Spring Meeting 1986** Minnesota Obstetrical and Gynecological Society, St. James Hotel, Red Wing, Minnesota. CONTACT: T. M. Julian, M.D., Box 395 Mayo Building, Minneapolis, Minnesota 55455. 612/373-4043.

23-24 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414. 612/376-7520.

25-27 **Topics and Advances in Pediatrics** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

JULY, 1986

7-9 **Orthopaedic Surgery: Shoulder** CME, Medical School, University of Minnesota, Hyatt Regency Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455. 612/373-8012.

11 **Shame-Based Clients: Clinical Techniques for Working with Self and Others; Program in Human Sexuality** 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota; CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; 612/376-7520.

11-12 **Ophthalmic Reviews** Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55095. 507/284-2085.

13-18 **Fourth Annual Chemical Dependency and Family Intimacy Summer Institute for Counseling Professionals** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; 612/376-7520.

17-20 **Multidisciplinary Conference on Cardiovascular Disease: Patient Problems** Abbott Northwestern Hospital, Grand View Lodge on Gull Lake, Brainerd, Minnesota. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407. 612/874-5461.

21-22 **Treatment of Families in Sexual Crisis Series Workshop $5: Treatment of Adult Victims and Perpetrators** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; 2630 University Avenue SE, Minneapolis, Minnesota; CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; 612/376-7520.

21-22 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota 55414. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414. 612/376-7520.

24-25 **Symposium on Nuclear Medicine** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455. 612/373-8012.

July 31-August 2 **Third Annual St. Paul-Ramsey Trauma Conference** St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, Wisconsin. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

SEPTEMBER, 1986

5-6 **Medical Directors** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

8-12 **49th Annual Radiology Course** Gastrointestinal and Abdominal Intervential Radiology; CME, Medical School, University of Minnesota, Willey Hall/AMFAC Hotel, 225 19th Avenue SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

8-19 **Fourth Annual Occupational Health and Safety Institute** School of Public Health and Office of CME; Continuing Education and Extension, University of Minnesota; Midwest Center for Occupational Health and Safety; Earle Brown Continuing Education Center, University of Minnesota, 1890 Buford Avenue, St. Paul, Minnesota; CONTACT: Ruth K. McIntyre, Director, Continuing Education, Midwest Center for Occupational Health & Safety, 640 Jackson Street, St. Paul, Minnesota 55101, 612/221-3992.

18-19 **Annual Trauma and Critical Care Seminar** CME, Medical School, University of Minnesota; Pillsbury Auditorium, HCMC, 701 Park Avenue, Minneapolis, Minnesota; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/626-5525.

18-20 **Teaching Geriatric Medicine** CME, Medical School, University of Minnesota; Radisson University Hotel; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55414; 612/626-5525.

19 **Pediatric Update** St. Paul-Ramsey Medical Center, St. Paul Hotel, 350 Market Street, St. Paul, Minnesota 55102. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

26 **Northwestern Pediatric Society Annual Meeting** Northwestern Pediatric Society, Thunderbird Hotel, 2201 East 78th Street, Bloomington, Minnesota; CONTACT: Mark Nammacher, M.D., 6845 Lee Avenue North, Brooklyn Center, Minnesota 55429; 612/566-9500.

26-27 **Adolescent Medicine Conference: High Risk Youth** CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

OCTOBER, 1986

1-3 **Annual Internal Medicine Review** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

3 **Chemical Exposures: Emergency Response & Management** St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, Minnesota 55101. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

Problems in Family Practice The Duluth Clinic, Ltd.; Spirit of the North Theater, Fitger's on the Lake, 600 East Superior Street, Duluth, Minnesota; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

8-11 **Principles of Colon and Rectal Surgery** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

10 **Primary Care Management of Low Back Pain** Abbott Northwestern Hospital, Northstar Center, 618 Second Avenue South, Minneapolis, Minnesota; CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; 612/874-5461.

15-18 **The 20th Annual Orthopaedic and Trauma Seminar** Hennepin County Medical Center, Hennepin County Medical Center, Pillsbury Auditorium, 701 Park Avenue South, Minneapolis, Minnesota 55415. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office - 813, 701 Park Avenue South, Minneapolis, Minnesota 55415. 612/347-2812.

17 **Geriatric Medicine-Cardiology** CME, Medical School, University of Minnesota; Pillsbury Auditorium; Hennepin County Medical Center; 701 Park Avenue; Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

18-19 **Update in Cardiology**, Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

20-22 **Clinical Reviews** Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

22-24 **Obstetrics and Gynecology Annual Autumn Seminar** CME, Medical School, University of Minnesota, Amfac Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE;, Minneapolis, Minnesota 55455. 612/373-8012.

24 **E.T. Bell Pathology Symposium** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

NOVEMBER, 1986

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905; CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; 507/284-2085.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center; 640 Jackson Street, St. Paul, Minnesota 55101; CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101, 612/221-3980.

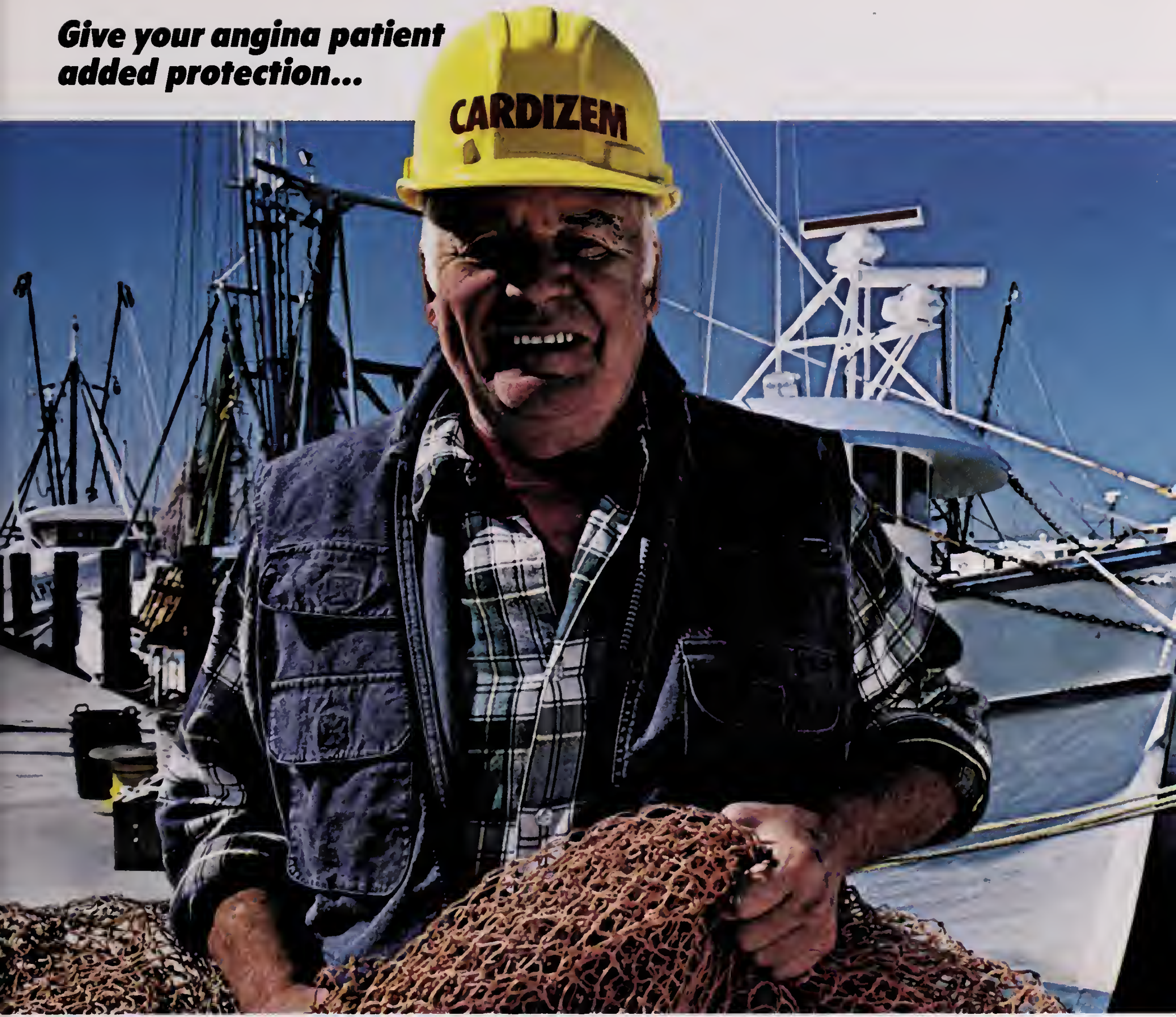
8-9 **1st Annual Heart and Lung Institute Conference** CME, Medical School, University Of Minnesota; Radisson University Hotel, 615 Washington Avenue, SE, Minneapolis, Minnesota; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; 612/626-5525.

13-15 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota 55101; CONTACT Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 612/221-3980.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association, St. Paul Hotel, 350 Market Street, St. Paul, Minnesota; CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; 612/378-1875.

DECEMBER, 1986

4-6 **Coronary Heart Disease** St. Paul-Ramsey Medical Center, Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota 55101; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; 612/221/3980.



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diltiazem HCl/Marion

- **The lowest incidence of side effects among the calcium channel blockers[1]**
- **An exceptionally safe choice for angina patients with coexisting hypertension, diabetes, asthma, or COPD[1-3]**
- **Proven efficacy when used alone in angina[1, 4-6]**
- **Compatible with both beta-blockers and nitrates[7]**

Please see brief summary of prescribing information on the next page.

CARDIZEM® 60 mg tid or qid

diltiazem HCl/Marion

FEWER SIDE EFFECTS IN ANTIANGINAL THERAPY

BRIEF SUMMARY

CARDIZEM® (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist).

INDICATIONS AND USAGE

1. **Angina Pectoris Due to Coronary Artery Spasm.** CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm. CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks).
2. **Chronic Stable Angina (Classic Effort-Associated Angina).** CARDIZEM is indicated in the management of chronic stable angina CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities.

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited Caution should be exercised when using the drug in such patients
3. **Hypotension.** Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.
4. **Acute Hepatic Injury.** In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes: however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM (diltiazem hydrochloride) in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation.

Pediatric Use. Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%), AV block (1.1%). In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence.

Cardiovascular:	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope
Nervous System	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia
Gastrointestinal.	Constipation, dyspepsia, diarrhea, vomiting, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH
Dermatologic	Pruritus, petechiae, urticaria, photosensitivity
Other	Polyuria, nocturia

The following additional experiences have been noted

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM erythema multiforme; leukopenia; and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited. Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers. In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage The following measures may be considered

Bradycardia	Administer atropine (0.60 to 1.0 mg). If there is no response to vagal blockade, administer isoproterenol cautiously.
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing.
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg, dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral LD$_{50}$'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively. The intravenous LD$_{50}$'s in these species were 60 and 38 mg/kg, respectively. The oral LD$_{50}$ in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity

DOSAGE AND ADMINISTRATION

Exertional Angina Pectoris Due to Atherosclerotic Coronary Artery Disease or Angina Pectoris at Rest Due to Coronary Artery Spasm. Dosage must be adjusted to each patient's needs. Starting with 30 mg four times daily, before meals and at bedtime, dosage should be increased gradually (given in divided doses three or four times daily) at one- to two-day intervals until optimum response is obtained. Although individual patients may respond to any dosage level, the average optimum dosage range appears to be 180 to 240 mg/day There are no available data concerning dosage requirements in patients with impaired renal or hepatic function. If the drug must be used in such patients, titration should be carried out with particular caution.

Concomitant Use With Other Antianginal Agents:

1. **Sublingual NTG** may be taken as required to abort acute anginal attacks during CARDIZEM therapy
2. **Prophylactic Nitrate Therapy** — CARDIZEM may be safely coadministered with short- and long-acting nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.
3. **Beta-blockers.** (See WARNINGS and PRECAUTIONS.)

HOW SUPPLIED

CARDIZEM 30-mg tablets are supplied in bottles of 100 (NDC 0088-1771-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1771-49). Each green tablet is engraved with MARION on one side and 1771 engraved on the other. CARDIZEM 60-mg scored tablets are supplied in bottles of 100 (NDC 0088-1772-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1772-49). Each yellow tablet is engraved with MARION on one side and 1772 on the other Issued 4/1/84

See complete Professional Use Information before prescribing

0642T5

References: 1. *Physicians' Desk Reference®*, ed 39. Oradell, NJ, Medical Economics Company Inc, 1985 **2.** Cohn PF, Braunwald E. Chronic ischemic heart disease, in Braunwald E (ed): *Heart Disease: A Textbook of Cardiovascular Medicine*, ed 2 Philadelphia, WB Saunders Co, 1984, chap 39 **3.** Schroeder JS. Calcium and beta blockers in ischemic heart disease When to use which. *Mod Med* 1982; 50(Sept):94-116 **4.** Subramanian VB Comparative evaluation of four calcium antagonists and propranolol with placebo in patients with chronic stable angina. *Cardiovasc Rev Rep* 1984, 5:91-104 **5.** Schroeder JS, Feldman RL, Giles TD, et al Multiclinic controlled trial of diltiazem for Prinzmetal's angina. *Am J Med* 1982; 72 227-231. **6.** Weiner DA, McCabe CH, Cutler SS, et al The efficacy and safety of high-dose verapamil and diltiazem in the long-term treatment of stable exertional angina *Clin Cardiol* 1985; 7 648-653. **7.** Shapiro W Calcium channel blockers Actions on the heart and uses in ischemic heart disease *Consultant* 1984; 24(Dec) 150-159

Another patient benefit product from

PHARMACEUTICAL DIVISION
MARION
LABORATORIES, INC.
KANSAS CITY, MO 64137

Before prescribing, see complete prescribing information in SK&F CO. literature or *PDR*. The following is a brief summary.

* **WARNING**

This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of triamterene and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Angiotensin-converting enzyme (ACE) inhibitors can elevate serum potassium; use with caution with 'Dyazide'. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function. Thiazides may add to or potentiate the action of other antihypertensive drugs. Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

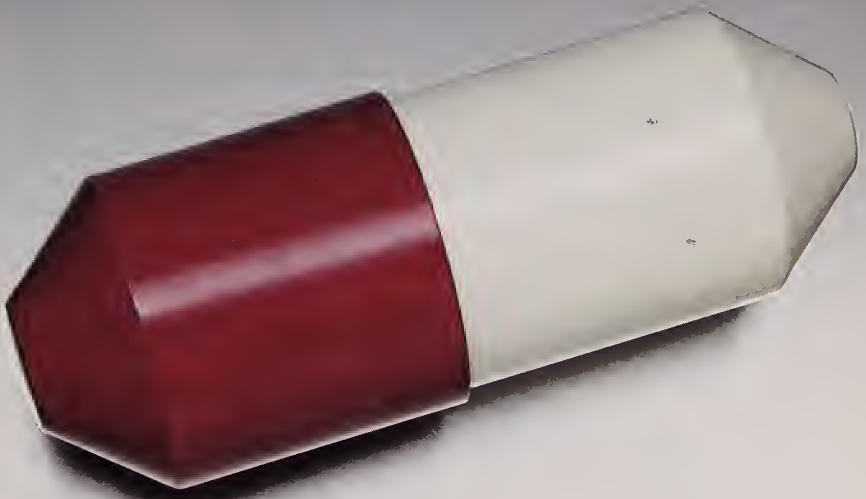
Supplied: 'Dyazide' is supplied as a red and white capsule, in bottles of 1000 capsules; Single Unit Packages (unit-dose) of 100 (intended for institutional use only); in Patient-Pak™ unit-of-use bottles of 100.

BRS-DZ:L42

In Hypertension*...
When You Need to
Conserve K+

Remember the Unique
Red and White Capsule:
Your Assurance of
SK&F Quality

Serum K^+ and BUN should be checked periodically (see Warnings and Precautions)



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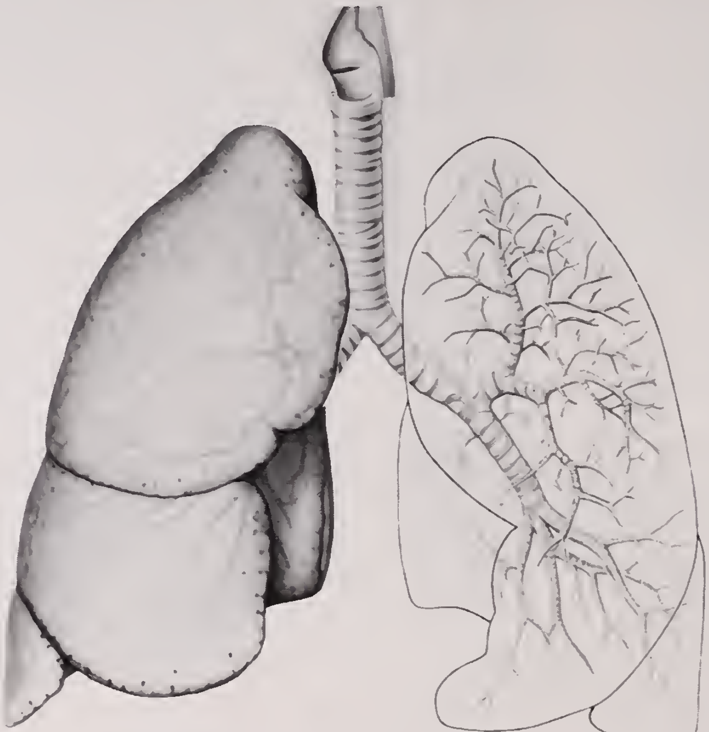

Ceclor® cefaclor

250-mg Pulvules® t.i.d. offers effectiveness against the major causes of bacterial bronchitis

Haemophilus influenzae (ampicillin-susceptible), *H influenzae* (ampicillin-resistant), *Streptococcus pneumoniae, Streptococcus pyogenes*

Note: Ceclor® is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

Ceclor® (cefaclor)

Summary. Consult the package literature for prescribing information.

Indications: Lower respiratory infections, including pneumonia, caused by susceptible strains of *Streptococcus pneumoniae, Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococci).

Contraindications: Known allergy to cephalosporins.

Warnings: CECLOR SHOULD BE ADMINISTERED CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS. PENICILLINS AND CEPHALOSPORINS SHOW PARTIAL CROSS-ALLERGENICITY. POSSIBLE REACTIONS INCLUDE ANAPHYLAXIS.

Administer cautiously to allergic patients.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics It must be considered in differential diagnosis of antibiotic-associated diarrhea. Colon flora is altered by broad-spectrum antibiotic treatment, possibly resulting in antibiotic-associated colitis.

Precautions:

- Discontinue Ceclor in the event of allergic reactions to it.
- Prolonged use may result in overgrowth of nonsusceptible organisms.
- Positive direct Coombs' tests have been reported during treatment with cephalosporins.
- In renal impairment, safe dosage of Ceclor may be lower than that usually recommended. Ceclor should be administered with caution in such patients.
- Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.
- Safety and effectiveness have not been determined in pregnancy, lactation, and infants less than one month old. Ceclor penetrates mother's milk. Exercise caution in prescribing for these patients.

Adverse Reactions: (percentage of patients)

Therapy-related adverse reactions are uncommon. Those reported include:

- Gastrointestinal (mostly diarrhea): 2.5%.
- Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment.
- Hypersensitivity reactions (including morbilliform eruptions, pruritus, urticaria, erythema multiforme, serum-sickness-like reactions): 1.5%; usually subside within a few days after cessation of therapy. These reactions have been reported more frequently in children than in adults and have usually occurred during or following a second course of therapy with Ceclor. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.
- Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.
- Other: eosinophilia, 2%; genital pruritus or vaginitis, less than 1%.

Abnormalities in laboratory results of uncertain etiology

- Slight elevations in hepatic enzymes.
- Transient fluctuations in leukocyte count (especially in infants and children)
- Abnormal urinalysis; elevations in BUN or serum creatinine
- Positive direct Coombs' test
- False-positive tests for urinary glucose with Benedict's or Fehling's solution and Clinitest® tablets but not with Tes-Tape® (glucose enzymatic test strip, Lilly)

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FAMILY PHYSICIAN wanted for rapidly growing, progressive family practice group in St. Paul. Some community service work. Contact: Tim Rumsey, M.D., 545 West Seventh Street, St. Paul, Minnesota 55102; (612) 293-9199. 2-6/86

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FAMILY PRACTICE AND INTERNAL MEDICINE positions available at the Faribault Clinic. The clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000, located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 N.E. First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

ST. PETER, MINNESOTA: Available immediately. Position of senior staff physician to work with progressive and forward-looking staff and administration to meet the medical needs of the patients at St. Peter Regional Treatment Center. JCAH accredited. Delightful setting in the heart of the Minnesota River Valley. University town of 10,000, ten minutes from Mankato, and one hour from the Twin Cities. Salary range in high-60's to 70's for BC/BE according to experience with excellent fringe benefit package and an opportunity for expanding income through minimal call. An AA/EOE employer. For further information contact: S.K. McHutchison, M.D., Clinical Director, St. Peter State Hospital, 100 Freeman Drive, St. Peter, Minnesota 56082; (507) 931-7707. 2-6/86

URGENT NEED: Primary physicians to volunteer two weeks of service in Honduras with the International Health Service, February, 1987. Contact: Paul Jensen, M.D.; (612) 927-4021. 3-7/86

PHYSICIAN OPPORTUNITIES available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write Minnesota Medicine (800), 2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414. (R)

MEDICAL PRACTICE SALES - Listed below are a few available practices: Allergy - Large Philadelphia practice; Family Practice & Internal Medicine - Two Philadelphia practices; Internal Medicine - Arizona; Bethesda, Maryland; large practice in Western Pennsylvania; Orthopedic Surgery - Western Pennsylvania; Pediatrics - Colorado, Eastern Pennsylvania and Southern New Jersey; Surgery - New Jersey. We specialize in the valuation and selling of medical practices. If interested in buying or selling a medical practice, contact our brokerage divison at: Health Care Personnel Consulting, 403 GSB Building, Bala Cynwyd, Pennsylvania 19004; (215) 667-8630. 2-6/86

INTERNIST /board certified or board eligible to join solo internist. Box 1161, St. Cloud, Minnesota 56302.

FAMILY PHYSICIAN OR GENERAL INTERNIST needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth which provides excellent referral and continuing education resources. Call collect (218) 834-2171 or write Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

LUTSEN SEA VILLA - two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $92,000. Call Jim at (612) 333-8361. (R)

Family Practice Opportunity at the Faribault Clinic. The clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 N.E. First Street, Faribault, Minnesota 55021; telephone (507) 334-3921. (R)

Family Practitioner needed to join two FP's at the Ellsworth, Wisconsin office of a progressive eleven physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. (R)

Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000.00 salary first year with incentive bonus, and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013 - phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator - phone (507) 526-7371;
personal phone (507) 854-3682. (R)

Gastroenterologist or Internist with subspecialty interest in gastroenterology (have all the equipment). Obstetrician/gynecologist, general surgeon, internist, family practice in 18 physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact Richard W. Golly, Austin Medical Clinic, P.A., 101 N.W. 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Emergency Medicine - Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard Golly, Austin Medical Clinic, P.A., 101 N.W. 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Family Physician - Four man family practice group needs to replace two leaving partners. Board eligible or certified desired. One year salary with partnership thereafter. Would also consider long-term locum tenens. Small town in Central Minnesota lakes area. Unopposed family practice clinic, 150-bed regional hospital at Brainerd, 100-bed nursing home, rotate calls. Call or write: C.R. Pelzl, M.D., Pine River Medical Clinic, Pine River, MN 56474; (218) 587-4416. (R)

Immediate Opening - Family Practitioner - River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes to the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona Based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

Canterbury Inn Bed & Breakfast - Rochester's unique alternative to hotel living. Victorian charm with modern comforts. Private baths, fireplace, central air conditioning, gourmet or special diet breakfast anytime, "tea-time" (wine, hors d'oeuvres, etc.) daily. Private, off-street parking, three blocks to Mayo Clinic and St. Mary's. A very special place for you, your colleagues, and your patients while in Rochester. $50/single, $60/double. 723 Second Street S.E., Rochester, Minnesota 55902; (507) 289-5553. (R)

Bemidji Clinic, Ltd. offers excellent opportunities for well trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator or N.A. Skogerboe, M.D., Medical Director: (218) 751-1280. (R)

Family Practice in clinic attached to small modern hospital, west-central Minnesota. Outstanding community for family living, excellent schools and recreational opportunities. Associate with two certified family practitioners with obstetrical, surgical and internist consultants available. For an excellent opportunity contact: Mark Rinehardt, Administrator, Johnson Memorial Hospital, Dawson, Minnesota 56232; (612) 769-4323. 1-5/86

Wanted: Family Practitioner - OB/GYN. Group practice, central Minnesota. Starting salary $55,000. Write Minnesota Medicine (755), 2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414. (R)

Family Physician and Internist needed for growing southern Minnesota clinic. Associate, solo or locum tenens position available. Will adjust to accommodate. St. James Area Family Clinic, Box 471, St. James, Minnesota 56081; (507) 375-3391. (R)

Family Practice - Northridge Family Medicine Clinic, P.A. is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Hunting Lodge for Sale - Three hour drive north of Minneapolis, near Floodwood, Minnesota. Excellent duck, deer and grouse hunting. Over 600 acres including 100 acre duck lake and wild rice bed. Ten year old dwelling, electric heat with wood heating supplement. Torrence Title. Includes rice harvesting and processing equipment. Ricehaven, Inc, Box 250, Cloquet, Minnesota 55720. (R)

Family Practitioner - Due to death of partner, a family practitioner is needed to join two remaining family practitioners in busy rural practice 175 miles west of Twin Cities. Serious candidates may obtain details about practice and community by contacting: Robert Ross, M.D. or Ronald Beyer, M.D. at Northside Medical Center; (612) 839-2516 or Richard Slieter, Administrator, Ortonville Area Health Services; (612) 839-2502 or by writing to the above at 750 Eastvold Avenue, Ortonville, Minnesota 56278. (R)

Practice in the Freedom of Montana's Big Sky Country - A family or general practitioner is needed for a small rural community with a clinic, hospital and nursing home. Access to major technology through the hospital system support services. Excellent place to raise children. Within driving distance to national parks, skiing, hunting and fishing. Salary and benefits negotiable. Contact: Michael R. Piper, Executive Vice President, Region I, Presentation Health System, 2101 Clark, Miles City, Montana 59301; (406) 232-6700. 3-7/86

Psychiatrist: Our exclusive client, a rapidly-growing national organization committed to providing high quality, cost effective, patient-oriented mental health and substance abuse services, seeks Adult Psychiatrist (BE/BC) for full-time staff opening in the Twin Cities. Position involves direct services, supervision and consultation in a multi-disciplinary clinical setting. Professional team includes Psychiatrists, LPs, LCPs, CCSWs, Psychiatric Nurses, and Certified Chemical Dependency Counselors. Salary to $100,000 (DOQ/DOE) plus benefit package of 20% of base salary plus bonus potential of up to 10% plus negotiable relocation expenses plus client organization will pay our agency service fee. If you think that you'd enjoy the freedom and independence of private practice with none of the financial risks, total personal and professional satisfaction, and highly attractive hours, please write or call collect in confidence on Job #3023 at: 612-926-6584, Jerry Neren, Physician Recruiter, MedSearch Corp., Southdale Medical Building, 6545 France Avenue South, Edina, MN 55435. 1-7/86

Family/General Practitioner needed to join staff at Grafton State School, a 400-bed residential facility for mentally retarded. Salary range: $37,104 to $55,116, negotiable. ND licensure required. Duties: managing acute and chronic medical conditions and preventive health. Excellent benefits and outdoor recreation. Send CV to Ken Yearwood, M.D., Director of Health Services, Grafton State School, West Sixth Street, Grafton, ND 58237 or call (701) 352-2140, Ext. 250. 1-7/86

Family Practice: Hastings Family Practice, P.A., is looking for a female BC/BE F.P. to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send curriculum vitae to D. R. Eckes, M.D., 1280 Ninninger Road, Hastings, MN 55033 or call (612) 437-8666. 3-8/86

Administrative Physician: Assistant Corporate Medical Director position available June 1, 1986 with rapidly expanding company located near Minneapolis, Minnesota. Position has fixed hours and does not involve direct patient care. Applicant should have an interest in occupational medicine, utilization review, computer applications to medicine, health risk assessment, wellness programs, and/or the determination of disability. Full time and part time positions are available with good opportunity for advancement. Send resume and salary requirements to: K. L. McDonough, M.D., P.O. Box 350, Elk River, MN 55330, or call (612) 441-6537. 1-6/86

Family Physician Wanted: board certified or eligible, to join three young family physicians in a growing family practice group. New facility. Northfield is a small, attractive college town (St. Olaf and Carleton) and is less than one hour from the Twin Cities and Rochester. Contact: Kenneth Sansome, M.D., David Larson, M.D., or Mark Mellstrom, M.D., Family Physicians of Northfield, 505 West Woodley, Northfield, MN 55057; (507) 663-1261. 1-7/86

Thinking of Sun Belt Retirement? F.P. couple seeking GP/FP to help in office 2-3 days per week while we expand our family. Easy commute from Dallas. Adjacent to large lake and two country clubs. Call or write S. Spain, M.D., Box 667, Kemp, TX 75143 (214) 498-2033. 3-8/86

Writing Assistance for medical journal articles, patient information brochures, marketing brochures. Ten years of experience in health care writing. Call Elaine Lampert, Freelance Writer (612) 447-5883. 3-8/86

Ophthalmologist: Wanted to join two-man ophthalmology group. High percentage of medical/surgical with minimal refractive work. Good incentive reimbursement program. Ophthalmology Associates, Oscar D. Anderson, M.D., John E. Hoines, M.D., 1630 Apache Blvd., Mankato, MN 56001. Phone: (507) 345-6152. 1-6/86

Practice Closed Saturdays? General Practitioner seeks small, fully-equipped office space for Saturdays-only clinic, Minneapolis. Contact Minnesota Medicine (key), 2221 University Avenue S.E., #400, Minneapolis, MN 55414. 1-6/86

Minnesota Twin Cities Area — growing multispecialty group with strong FP department seeks additional physicians for main clinic and satellites. Competitive financial package. Call (716) 884-3700 or write Four-MNM Vermont Street, Buffalo, NY 14213. 1-7/86

Island for Sale: Beautiful one and one-half acre wooded island with three-bedroom log cabin on Farm Island Lake near Mille Lacs. Property includes the entire island, cabin with fireplace, large storage barn, small boathouse on island; also 50 feet of lake frontage on shore. Electricity, running water, full kitchen (complete with utensils and appliances), and a three-quarter bath. Large beach with sandy bottom. Also includes speedboat and outboard motor and pontoon boat with motor. For further information, call Jim Ruttger at (218) 829-2222 or Bob Mattison at (612) 870-6878 or (612) 522-5353. 1-6/86

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity, serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, MN. The hospital is well equipped, with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department and well-equipped surgery department. Fairmont is unique, with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, MN 56031. 4-9/86

West-Central Minnesota Area: Opportunity available for Internist, board eligible/board certified physician, in a 7-physician multispecialty group. Competitive and guaranteed first-year contract with bonus, malpractice paid and excellent fringe benefits. Opportunity to buy into practice after first year. Contact: Morris Medical Center, Box 600, Morris, MN 56267 (612) 589-3232. 2-7/86

General Internist: We are in need of a qualified Internist, preferred Board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic located next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, MN 55072 (612) 245-2212. 1-6/86

42-Year Old Residency-Trained: board certified family physician wants to share patient panel and work hours with qualified FP. Currently working approximately 60 hours per week plus week-end call two week-ends out of ten. Wish to reduce work hours by half. Member of ten-person multispecialty group located in county seat. Service area of approximately 30,000. Clinic located adjacent to 50-bed hospital and nursing home. Southwest State University located in town plus other cultural and educational advantages. Contact Vincent D. LaPorte, M.D., Doctors' Plaza, 300 South Bruce Street, Marshall, MN 56258 (507) 532-9631. 1-6/86

Pediatrician: BC/BE to join a 4-Pediatrician Department in clinic with OB/GYN and Pediatrics. Excellent practice one hour from Twin Cities metro area. Salary plus excellent benefit package leading to partnership. Send Curriculum Vitae to Cheryl Regan, Business Manager, Women & Children's Medical Center, 1520 Northway Drive, St. Cloud, MN 56301. 2-7/86

Internist or Family Practitioner. Position available with established medical group in community of 6,000. Excellent facility with 49-bed JCAH hospital adjacent. Southeastern South Dakota college community offers excellent professional and recreational opportunity. Contact: Administrator, Madison Clinic, Ltd., 903 North Washington, Madison, SD 57042 (605) 256-4564. 2-7/86

Escape into an Unforgetable romantic sailing adventure on a private yacht with a professional licensed captain and crew to take the worry out of your cruising vacation in the British and U.S. Virgin Islands. (612) 347-1245. 2-7/86

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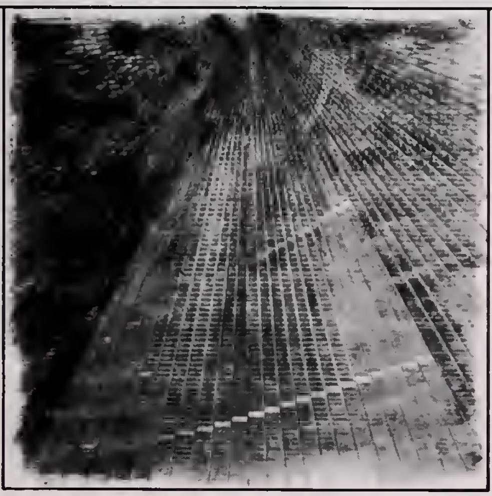

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Dr. Fluth is a physiatrist and Medical Director of the Knapp Rehabilitation Center at Metropolitan Medical Center and Chief of Physical Medicine at the Hennepin County Medical Center.

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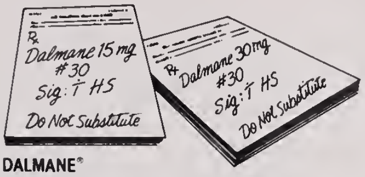

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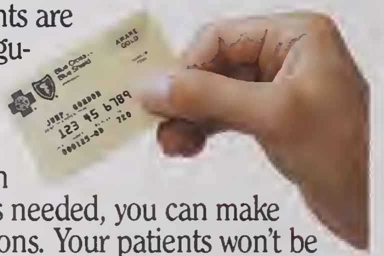

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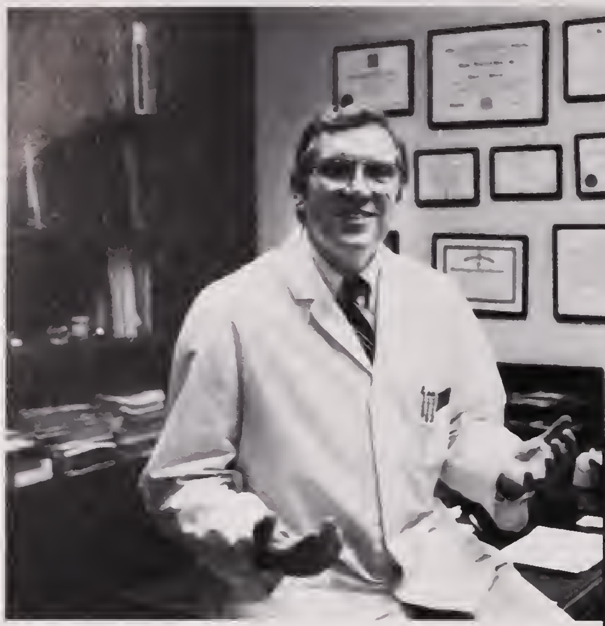

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President's Letter

Rural Minnesota Health Care: Recognizing the Difference

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

The Minnesota Coalition on Health Care will soon complete its Rural Initiative Study. As a part of the Initiative, six rural Town Hall meetings were held. I attended all six of these meetings held in Grand Rapids, Little Falls, Thief River Falls, Fergus Falls, St. Charles, and Worthington.

Concerns voiced fell into four general areas:

1. The rising cost of health insurance which is becoming unaffordable to rural Minnesotans;
2. The threat of hospital closures;
3. The ability to meet long-term care needs of an aging population; and
4. The health effects of the farm crisis, especially mental illness at all ages.

The general conclusion from these meetings is that rural Minnesota is different from urban Minnesota and rural health care also differs from urban health care.

There are some obvious reasons for this, many of which we have known about for years. The rural economy is based almost totally on agriculture, mining, tourism, forest products, and small support businesses. All of these are experiencing economic hard times. This downturn began with the last recession and has not recovered as has the urban economy in Minnesota. **In effect, we have a two-tiered economy in the state of Minnesota that is beginning to dramatically affect how health care is delivered to the rural population.**

In rural Minnesota, population density is minimal, distances to services are greater, services are often more limited by economics of scale, reimbursement for procedures may be as little as 25 percent of the urban standard, proportionately there are more elderly and impoverished persons, and the governmental infrastructure is often weak to nonexistent.

These differences have long existed but have generally been ignored by urban-based government and other institutions including the Minnesota Medical Association. The MMA has generally ignored rural Minnesota for two reasons. First, because most of the major changes that occur in the health care delivery system happen in the urban area first, and because of this the MMA has concentrated its efforts in the urban setting with the hope that we could build on the positive features and neutralize the negative features in the programs thrust upon us.

Second, because the rural attitude has generally been one of comfortable isolationism, i.e., "we prefer to be left alone to our own devices." This attitude is no longer workable because the needs are rapidly increasing and the resources to deal with these needs are rapidly decreasing as the federal budget cuts come down to the local level.

As these trends continue, **difficult problems of access to services and quality of care issues will result. Rural Minnesota and its health care providers are beginning to address these issues. They are exploring ways to deliver services more efficiently and effectively and are making every effort to conserve and share scarce resources. Regardless of this, they will not be able to work through this current crisis on their own.** This raises the question of outside urban assistance or subsidy and the question of fairness.

It also raises the question of what role the MMA should play in this process. Two obvious activities come to mind. First, the Minnesota Medical Services Corporation should do whatever it can to publicize its consultative services to all rural medical practices. This will assist these practices through the very difficult transition time they face. Second, the MMA should vigorously publicize the rural economic and health care crisis to all governmental bodies, and the MMA should continue to seek fairness to all reimbursement fee schedules.

Rural health care problems are different from urban. We must recognize these differences and begin to deal with them.

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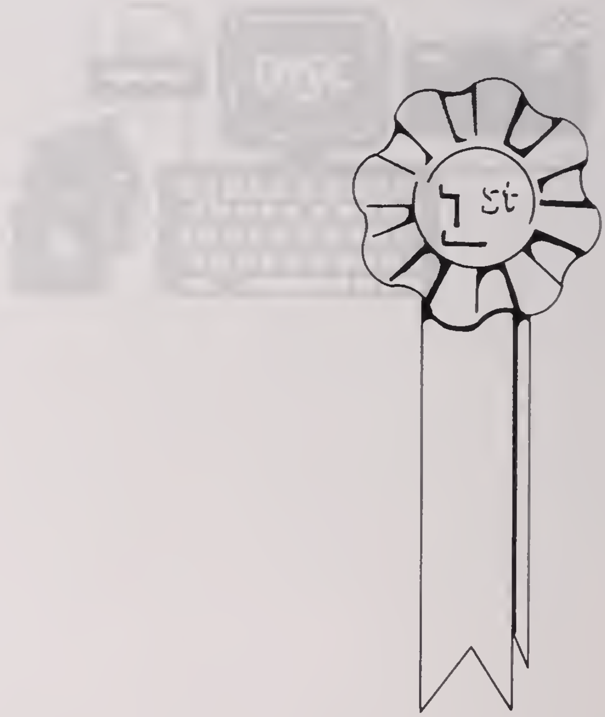

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Comprehensive Protective Care in the Management of Acute Leukemia

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Twenty patients with acute non-lymphocytic leukemia were treated in a community hospital for initial remission induction utilizing aggressive, multiple drug chemotherapy and a Comprehensive Protective Care System. The Comprehensive Protective Care System was designed: (a) to reduce or delay acquisition of hospital gram negative flora, (b) to reduce acquisition of gram positive flora from personnel, and (c) to reduce fungal exposure. A complete remission rate of 85% was achieved. Six patients developed documented infections. Two of these had coagulase positive staphylococcal bacteremia, one patient developed pseudomonas aeruginosa bacteremia, one patient developed klebsiella pneumoniae bacteremia, one developed a superficial staphylococcal infection of the Hickman site and one an E. coli urinary tract infection. No fungal infections occurred. Only one patient died as a result of possible infection. This study demonstrates one of the lowest infectious death rates among leukemics undergoing remission induction chemotherapy. A detail of the Comprehensive Protective Care System is described.

Recently, there has been significant progress in the management of acute non-lymphocytic leukemia. Complete remission rates of 50 to 80% are routinely achieved with aggressive, multiple drug chemotherapy and supportive care.

Infectious complications are the leading cause of mortality among patients undergoing remission induction chemotherapy.[1,3] Most infections in these immunocompromised patients are related to gram negative organisms, staphylococci, or fungus infections such as candida, aspergillus, and mucormycosis.[1,2] The hospital-acquired gram negative flora is a frequent source of serious gram negative infections.[4] Food contains high counts of enterobacteriaceae and pseudomonas and can serve as a source for intestinal colonization.[5] Staphylococci and other organisms can spread from hands of personnel to the patient. Room carpets can be contaminated with bacteria.[6] It is possible that fungus in the room and carpet dust, as well as moldy bread, may be a source of fungus infection. Candida in the mouth may disseminate farther down the GI tract as well as systemically in leukopenic patients.[7]

There is no standard approach to reduce morbidity and mortality from infections in these patients. Laminar flow rooms and isolators have been used in certain major centers,[8] but are impractical for most community hospitals. Protective isolation has been reported in the literature but never well defined or standardized. A recent study of simple, protective isolation using gloves and gowns found no advantage in such patients.[3] As a result of these reports, many institutions have completely abandoned all "protective isolation" techniques and principles.

From 1976 to 1981, we used a comprehensive protective isolation protocol with three main objectives: (a) to reduce or delay acquisition of hospital gram negative flora, (b) to reduce acquisition of gram positive flora from personnel, and (c) to reduce fungal exposure. The protocol was applied to the care of 20 patients undergoing initial remission induction chemotherapy for non-lymphocytic leukemia. This paper reports the methods employed and the results of the program.

Components of Comprehensive Protective Care were as follows:

1. Placement and Removal from Comprehensive Protective Care (CPC).

Patients were entered into the protocol when white counts were below 1000 or PMN counts below 500. They were removed from CPC when counts exceeded these levels for 48 hours.

2. Physical Plan.

(a) Carpeting was removed from CPC rooms and hard, seamless floors were installed.

(b) Room was cleaned and mopped with disinfectant ("Beaucoup") including the furniture and sink. Cleaning of the room was maintained on a daily basis with disinfectant mopping of flat surfaces and sink.

(c) Doors and windows were kept closed.

(d) New air filters were installed before each new patient was admitted to the room.

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3. Procedures or Tests.

Whenever procedures or tests were necessary outside the room, the time outside the room was kept to a minimum and the patients were required to wear a mask.

4. Dietary Management.

Patients received only sterile water to drink. A low bacteria diet was supplied that excluded foods known to have high bacterial contents such as fresh salads, yogurt, fresh fruits, raw vegetables, and creamed potatoes. Breads were avoided to cut down acquisition of fungus; and crackers, rye crisp, and rusk were substituted. The food was cooked thoroughly and not allowed to stand before being served. The food tray was sent to the floor wrapped in a cellophane bag.

5. Periods of Bowel Rest.

If the patient developed GI symptoms such as abdominal pain, distention or diarrhea, it was presumed that there was intestinal mucosal injury or sloughing secondary to chemotherapy. A period of bowel rest was then instituted. During this bowel rest, the patient could drink sterile water but no food was given and nutrition was provided by intravenous hyperalimentation. It was reasoned that the bowel rest would reduce entry of bacteria from denuded intestinal mucosa into the blood stream.[2]

6. Protective Equipment for the Staff.

Sterile gloves, gowns and masks, and booties were required of all individuals entering the room.

7. Protective Procedures for the Patient.

Sterile cotton was provided instead of toilet paper. Rectal temperatures and rectal exams were avoided. Enemas and suppositories were avoided. Mycostatin swish and swallow was given 3x a day. Mycostatin vaginal cream or suppositories were inserted daily in female patients.

8. Management of Febrile Patients.

Patients with temperatures greater than 101°F were evaluated by clinical exam; blood, urine, and throat cultures; and culture of any suspicious infected site. Chest X-rays were routinely carried out. After cultures were obtained, patients were promptly placed on combination antibiotic therapy which included Carbenicillin, Cephalothin, and Gentamycin among the earlier patients and Ticarcillin and Tobramycin during the last 2 years. Antibiotics were continued until counts returned to the level that would allow discharge from protective isolation. If patients remained febrile for more than 3 days after the institution of antibiotics, leukocyte transfusions were started and continued for a period of 5 days. If, despite the leukocyte transfusions, the patient continued a febrile course, Amphotericin B was added because of possible undetected fungal infection.

Patient Population

Twenty patients were managed with this "Comprehensive Protective Care." All received aggressive chemotherapy consisting of Daunomycin, Ara-C, 6-Thioguanine, Vincristine, and Prednisone. The patients' ages ranged from 19 to 67 with a median of 55. The types of ANLL (Acute Non-Lymphocytic Leukemia) were as follows: acute myelogenous - 15, monocytic - 1, myelomonocytic - 1, erythroleukemia - 1, and acute promyelocytic - 2 patients. During this period, 10 additional patients were diagnosed to have leukemia at this hospital but were not a part of this study. Two of these decided to transfer to the University Hospital. Six elderly patients (ages 72 to 84) refused to either have hematology consultation or treatment after discussion with their families and physicians. One patient with concomitant cirrhosis and hepatic coma received a partial course of chemotherapy at the family's insistence and died on the fifth hospital day and was considered to be nonevaluable. One patient was not placed in CPC.

Results

Eighteen of the 20 patients developed fever during the induction period. The onset of fever usually correlated with neutropenia and, in some cases fever continued despite all measures until the counts returned to normal. All 18 patients received multiple antibiotics as mentioned above. Eleven of the 20 patients received granulocyte transfusions, receiving an average of 8 units (range 2 to 12 units). Four patients received Amphotericin B. Although there was no definite evidence for fungal infection, Amphotericin was given to these patients because of persistent fever despite antibiotics and white cell transfusions.

Documented Infections

Only one of these patients died. The patient presented with initial fever and a positive coagulase negative staph blood culture. He was started on multiple antibiotics and chemotherapy. All subsequent cultures turned out to be negative. However, the patient remained febrile and developed atrial fibrillation congestive failure and expired during the induction period. Of the remaining patients, six developed documented infections. These included coagulase positive staphylococcal bacteremia in two, pseudomonas aeruginosa bacteremia in one (this patient also had a perirectal abscess), and klebsiella pneumonial bacteremia arising from an infected Hickman site in one. Local infection without bacteremia developed in two patients, including a coagulase positive staphylococcus infection of the Hickman site in 1, and E. coli urinary tract infection in one. All of these patients had been started on multiple antibiotics as soon as they became febrile prior to documentation of infection. The two patients with staph coagulase positive bacteremia had been started on Cephalothin, Gentamycin, and Carbenicillin. One of them also received white cell transfusions. Both of these infections were thus eradicated. The patient with pseudomonas bacteremia received Cephalothin, Gentamycin, Carbenicillin, and white cell transfusions. One patient with klebsiella bacteremia received a combination of Gentamycin and Ticarcillin.

Remission Rate

Complete remission was achieved in 17 of the 20 patients (85%). Partial remission occurred in two patients lasting 4 and 7 months, respectively. Survival among patients achieving complete remission ranged from 9 to 42 months, with an average of 20 months. All of these patients eventually died with recurrence. Some patients had second remissions. However, eventually all of these patients became resistant to further therapy.

Discussion

Complete remission rates ranging from 43 to 82% have been reported in recent studies in acute non-lymphocytic leukemia.[3,9] Infection is the major cause of death among patients undergoing initial remission induction chemotherapy. Anywhere from 20 to 40% of patients succumb to this particular complication. Nauseef and Maki recently reported a 40% death rate (8 out of 20 patients) from infection among their leukemic patients treated under simple protective isolation. Among our patients, only 1 of the 20 patients died as the result of possible infection which was demonstrated prior to the administration of chemotherapy.

It is probable that our Comprehensive Protective Care program was instrumental in reducing or delaying the acquisition of gram negative hospital flora. Low bacteria diet, sterile water, and periods of bowel rest may have been helpful in this regard. It is of note that the program was successful in totally preventing fungal infections, a frequent cause of death in such patients. Staphylococcal infections occurred in two of our patients. More meticulous handwashing and site care techniques may be required to reduce this particular infection. This study demonstrates one of the highest reported remission rates and the lowest infectious death rate in patients with acute non-lymphocytic leukemia undergoing initial remission induction chemotherapy. Further controlled studies should be carried out to establish the effectiveness of the Comprehensive Protective Care System described here.

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Indications for Computerized Axial Tomography in Low Back Pain and What to Look for in the Scan

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The CAT scan is now widely used in the diagnosis and understanding of low back pain. Precise indications for its use in the lumbar spine are outlined. In the interpretation of the scan, the classifications of disc ruptures by MacNab, and stenotic lesions by Kirkaldy-Willis and Heithoff are recommended. The patho-anatomy of these two entities is outlined with corresponding axial tomographic findings.

The fact that the CAT scan is a non-invasive procedure has encouraged its widespread use, in addition to the fact, of course, that it provides a very clear axial anatomy of the lumbar spine that enables a specific diagnosis to be made more often than not.

It has provided the physician another dimension in the understanding of the complex subject of low back pain. However, this very advanced example of modern medical technology has also presented the primary physician with a certain dilemma regarding its optimal use. Should plain X-rays of the lumbar spine be requested any more, or should a CAT scan be requested in lieu, and as often? Additionally, the media-informed patient may strongly request or demand that the doctor obtain the scan.

The indications for a CAT scan may be clear-cut in many situations, but some guidelines toward its use are always helpful in dealing with the variegated presentations of patients with low back pain. At what stage should one request a scan; what are its indications, which, incidentally, would also make it most cost effective?

Indications

In the management of low back pain, the most important step is to make a diagnosis, although this may often times be difficult. However, an attempt toward a "structural diagnosis" must be made, and nothing is more crucial in this respect than a detailed history and a comprehensive clinical examination. It is almost a truism to say that no amount of investigative aid, however sophisticated, can take the place of a sound clinical evaluation, not even CAT scanning.

1. With *acute disc herniation and nerve root compression*, the patient presents with low back and leg pain, the leg pain often being more acute than the back pain; the pain is aggravated by activity, by coughing, sneezing and straining and is relieved by rest. The pain is often sharp and radiates to below the knee into the calf and foot. Pain may be accompanied by numbness and tingling and sometimes weakness. Clinical evaluation will reveal positive tension signs viz. the straight leg raising test and bowstring sign, neurological impairment, and occasional muscle tenderness. The patient may have reduced mobility and sometimes exhibit a list.

Investigations at this point in time would include plain X-rays, and management would consist basically of rest, either at home or in the hospital. If no improvement is noted in a week's time or sometimes less, then a CAT scan should be requested, the aim being the confirmation of the diagnosis and preparation for further aggressive management that might become necessary: an epidutal injection, intradiscal chymopapain injection, or discectomy.

With a late or *sub-acute* presentation, the findings will be less classic. In such circumstances, after a clinical diagnosis has been made and conservative therapy instituted, there may be a place for earlier scanning, mainly for clarification of the diagnosis.

2. Besides disc herniation, leg pain, often bilateral, associated with back pain, may be encountered in *zygoapophyseal or facet joint syndrome and segmental instability*; this entity is sometimes referred to as *mechanical low back pain*. These conditions result from disc space narrowing, brought about by disc herniation or disc degeneration. With loss of disc height, the facet joints become stressed, their movements irregular, occasional subluxation may occur and instability results with degenerative changes to follow. The patient presents with catching pain in the back or with recurrent episodes of the back "going out." The pain often radiates into

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both thighs, and occasionally below knee level. A CAT scan at this stage would help, but only indirectly, in that there would be neither a herniated disc nor spinal stenosis. Instead, degenerative facet arthropathy would be present very often, with occasional rotation and asymmetric opening of the facet joint indicative of instability. More pertinent investigations would be bending films of the lumbar spine or perhaps a discogram.

3. *Spinal stenosis* is generally seen in an older age group. The pain is in one or both legs, in addition to the low back. Classically, pain is aggravated by walking, sometimes by standing. Often the patient is forced to rest before resuming walking again, a situation suggestive of intermittent claudication. Sometimes the elderly patient will have no pain but will complain of legs feeling weak or wobbly and giving out while walking, causing the patient to fall.

These symptoms are classically noted with *central spinal stenosis*. With *lateral spinal stenosis*, the presentation will be more like a herniated disc, often with pain in one leg. Clinical findings in both central and lateral spinal stenosis, unlike disc herniation, may be sparse or absent; tension signs are absent and neurological evaluation normal or non-localizing. In some instances, neurological changes may become evident only after having the patient exercise for some time.

While the myelogram may show a "waisted" appearance or even a block in full-blown central stenosis, there is no better corroborative test than a CAT scan. In fact, a firm diagnosis of lateral stenosis can only be made with a CAT scan; the myelogram is virtually uninformative in this regard, as the pathology lies lateral to the furthermost extent of the dye in the nerve root sleeve. This has been amply confirmed by Heithoff's elegant prospective study of lateral spinal stenosis using both metrizamide myelogram and CAT scans.[1]

4. *Work-related low back pain* can be a complex problem, often resistant to all modalities of treatment. While a small number of cases will have a disc herniation or an annular tear, no specific organic pathology will be demonstrable in the vast majority. In such cases, after an adequate period of time has been spent in the trial of conservative therapy, a CAT scan may be useful to confirm the essentially non-organic nature of the injury and bring some sort of resolution to the uncertainty of the problem.

5. With proper selection, decompressive surgery of the low back for disc herniation or spinal stenosis is generally very successful. In a few cases, however, either because of a recurrent disc herniation or inadequate decompression of spinal stenosis, pain may recur or may not have been entirely relieved. In such cases of *continuing or recurrent post-operative pain*, competent tomographic assessment is invaluable; attenuation studies performed by the radiologist could help differentiate between scar tissue and recurrent herniated disc material. Often a omnipagne-enhanced CAT scan will be necessary.

6. Other related areas where CAT scanning is very informative include *trauma and neoplasm of the lumbar spine*. Here the scan is often used to delineate the extent of the problem rather than to make a specific diagnosis. However, as far as fractures of the spine are concerned, it is very valuable in burst fractures and flexion rotation fracture dislocations.[2]

The presentations categorized above would constitute the main indications for computerized axial tomography in a patient with low back pain.

Interpretation

Very few of us have been trained to look at contiguous axial anatomy and piece things together; but with a little information and some practice, unfamiliarity with the axial scan should cease and the causative pathology should become more easily identifiable.

1. Disc Pathology: For the sake of better understanding and standardization, the following classification of disc ruptures as evolved by MacNab[3] is recommended:

A. Disc Herniation

Type I	Prolapsed Disc, wherein the displaced nuclear material is confined solely by the outermost fibers of the annulus.
Type II	Extruded Disc, wherein the nuclear material has burst through the annulus but lies under the posterior longitudinal ligament.
Type III	Sequestrated Disc, wherein the nuclear material has extruded through the ligament to lie free in the canal.

B. Disc Protrusion

Type I	Diffuse Annular Bulge, wherein the

annulus protrudes circumferentially beyond the periphery of the vertebral body with disc collapse.

Type II Localized Annular Bulge.

The terms *contained* and *non-contained disc herniation* are occasionally used. The disc is understood to be contained when the posterior longitudinal ligament is intact. Prolapsed and extruded discs would therefore be contained discs, and sequestrated discs non-contained. However, if the nuclear material has broken through both the annulus and the ligament without breaking loose, so that it is not quite a sequestrated disc, it would technically be a non-contained disc herniation.

In the CAT scan, a prolapsed disc herniation would be seen as discrete nodular or lumpy bulge, asymmetric, usually postero-lateral in location and small in extent (Figure 1). A localized annular bulge would also present in this manner. When the discrete nodular or the focal lumpy bulge is moderate or large in extent, a diagnosis of an extruded disc is made (Figure 2). When there is a marked cephalad or caudal extension, or the fragment is noted to be separate, a diagnosis of sequestrated disc herniation or free fragment is made (Figure 3). A diffuse annular bulge presents as a smooth curvilinear convexity impinging on the thecal sac (Figure 4). The bulge is symmetric, as opposed to the asymmetry characteristic of prolapsed disc herniation.

In the reading of the CAT scan, the absolute sign of the disc herniation or bulge itself is not as important as the effects it produces. These secondary effects can be: (1) obliteration of the epidural fat; (2) distortion of the normal contour of the thecal sac and displacement of the nerve root; (3) impingement or compression of the nerve root, and edema. The nerve root swelling is most often distal to the site of impingement.

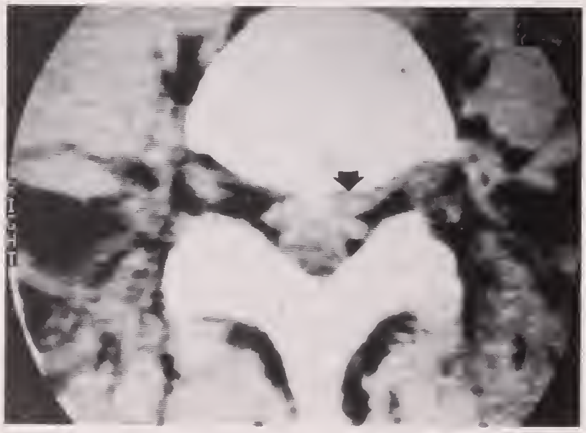

Figure 1 - Classic example of a prolapsed disc at L5/S1, with dorsal displacement of the left S1 nerve root.

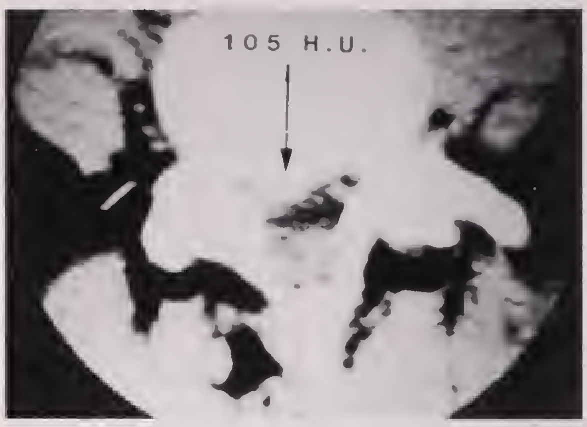

Figure 2 - Large extruded disc herniation at L5/S1 on the right.

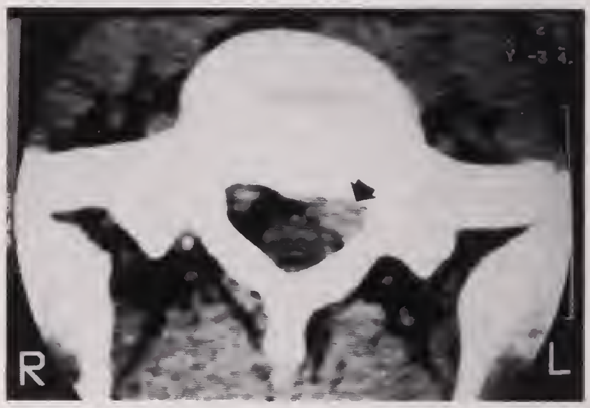

Figure 3 - Large sequestrated (free-fragment) disc herniation at L5/S1 on the left.

In the case of disc prolapse or extrusion, obliteration of the epidural fat antero-laterally is a very sensitive finding.[4] The epidural fat that intervenes between the herniating disc and the thecal sac or nerve root must be displaced first before the affected disc can make contact with the neural component and displace it. The distortion of the normal contour of the thecal sac and the displacement of the nerve root are important diagnostic findings as are impingement or compression of the nerve root and edema arising therefrom.

2. Stenotic Lesions: These are more difficult to interpret and need high resolution scans with contiguous 5 mm images from the midbody of S1 to the pedicles of L3 vertebrae, and often parasagittal

reformatted views as well. The axial view is best for the delineation of the central canal, lateral recess and the facet joints[5]; but the parasagittal views are particularly helpful in the evaluation of lateral spinal stenosis, the so-called failed back surgery syndrome including evaluation of spinal fusion, in the differentiation of specific types of disc herniation and spondylolisthesis.[6]

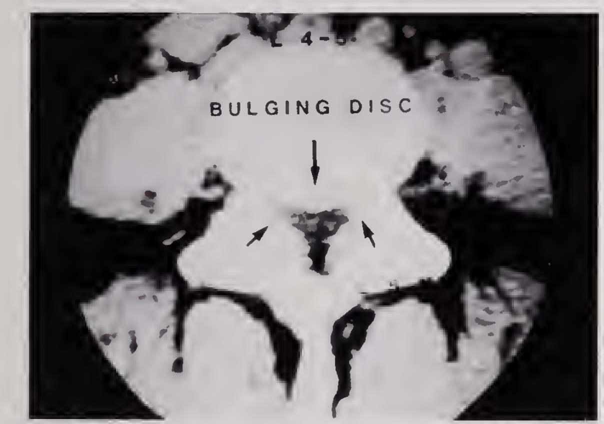

Figure 4 - Concentric diffuse bulging of the disc annulus. Note how symmetrical the annulus is. Note also the thickened ligamentum flavum.

Again for the sake of clear understanding and standardization, the classification of Kirkaldy-Willis[7] and Heithoff[8] is recommended. According to this classification, the stenotic lesions may be the result of:

A. Central Stenosis
B. Subarticular Recess Stenosis
C. Lateral Spinal Stenosis

Subarticular recess stenosis is sometimes referred to as lateral recess stenosis, and lateral spinal stenosis as foraminal stenosis or intervertebral nerve root canal stenosis.

A. Central Stenosis

Anatomy: The spinal canal consists of a series of contiguous intraosseous and interosseous segments. At the intraosseous segment, the central canal is constituted by a complete bony ring: the vertebral body, pedicles, and lamina; at the interosseous segment, the bony ring is incomplete, the posterior margin being formed by the ligamentum flavum and laterally by the intervertebral foramina.

Acquired central stenosis is brought about by degenerative changes in the articular processes and is most frequently the result of overgrowth of the inferior articular process. Secondary thickening and buckling of the ligamentum flavum posteriorly and associated degenerative central bulging of the disc anteriorly complete the encircling central stenotic lesion.

Characteristically, degenerative central spinal stenosis produces an outwardly concave triangular appearance of the central canal (Figure 5). It occurs most often at the L3/L4 and the L4/L5 levels.

B. Subarticular Recess Stenosis

Anatomy: The subarticular (lateral) recess is that space within the antero-lateral aspect of the central spinal canal that is ventral to the base of the superior articular process at its junction with the lamina, and dorsal to the intervertebral disc. It is a lateral extension of the central canal and becomes a recess when the canal is trefoil in configuration or when there is medial hypertrophy of the base of the superior articular process. The recess is therefore a pathological entity and is not present in the normal spine.

Subarticular recess stenosis is the result of degenerative processes, and nerve impingement is brought about by medial hypertrophy of the base of the superior articular process posteriorly and by disc protrusion or herniation anteriorly (Figure 6). It occurs most often at L4/L5 and L5/S1 levels and causes impingement of the travers-

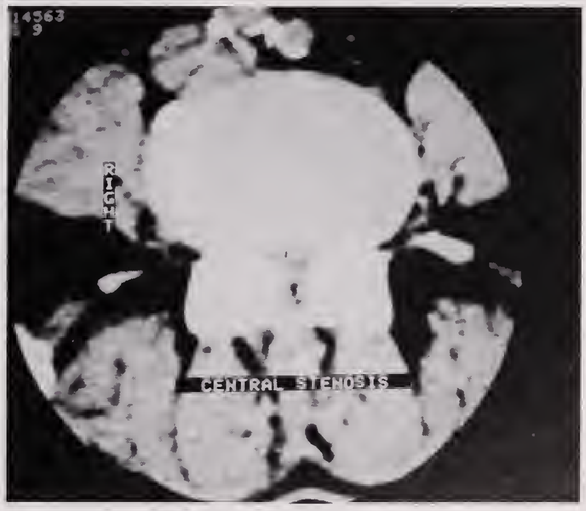

Figure 5 - Severe central stenosis, result of facet joint hypertrophy and ligamentum flavum thickening posteriorly and disc bulging anteriorly. Note the outwardly concave triangular appearance of the central canal.

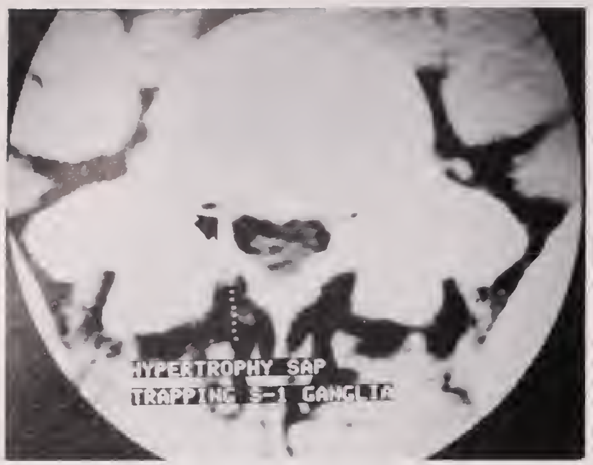

Figure 6 - Bilateral sub-articular recess stenosis secondary to medial hypertrophy of the base of the superior articular process of S1 on the right, and the bulging disc anteriorly.

ing nerve root, the L5 nerve root at L4/L5 level and the S1 nerve root at the L5/S1 level.

C. Lateral Spinal Stenosis

Anatomy: The nerve root canal is also referred to as the nerve root tunnel or nerve root foramen. The term lateral recess is also used on occasion but is anatomically inaccurate and confusing. It begins medially where the nerve root comes off the dural sac and ends laterally where it emerges from the intervertebral foramen. It is bounded superiorly by the pedicle and the inferior articular process of the vertebra above, inferiorly and posteriorly by the pedicle and superior articular process of the vertebra below, and anteriorly by the vertebral body and disc.

Lateral spinal stenosis is also the result of degenerative processes; the exiting nerve root is impinged in the nerve root canal by a postero-lateral osteophyte arising from the vertebral body anteriorly and hypertrophy of the superior articular process or facet joint posteriorly (Figure 7). It occurs most commonly at the L5/S1 level, where it involves the exiting L5 nerve root.

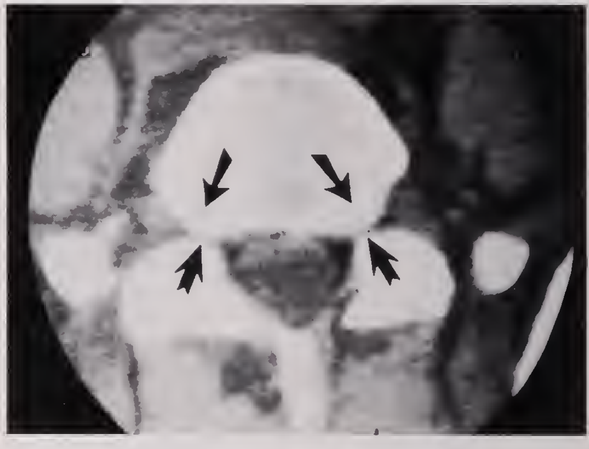

Figure 7 - Lateral spinal stenosis (bilateral) result of postero-lateral spurring from the vertebral body anteriorly and hypertrophy of the superior articular processes posteriorly.

These classifications, based on the clear understanding of the patho-anatomy of disc derangement and spinal stenosis, are invaluable in the "reading" of the images and should help immensely in the quest for what to look for in the scan of the lumbar spine.

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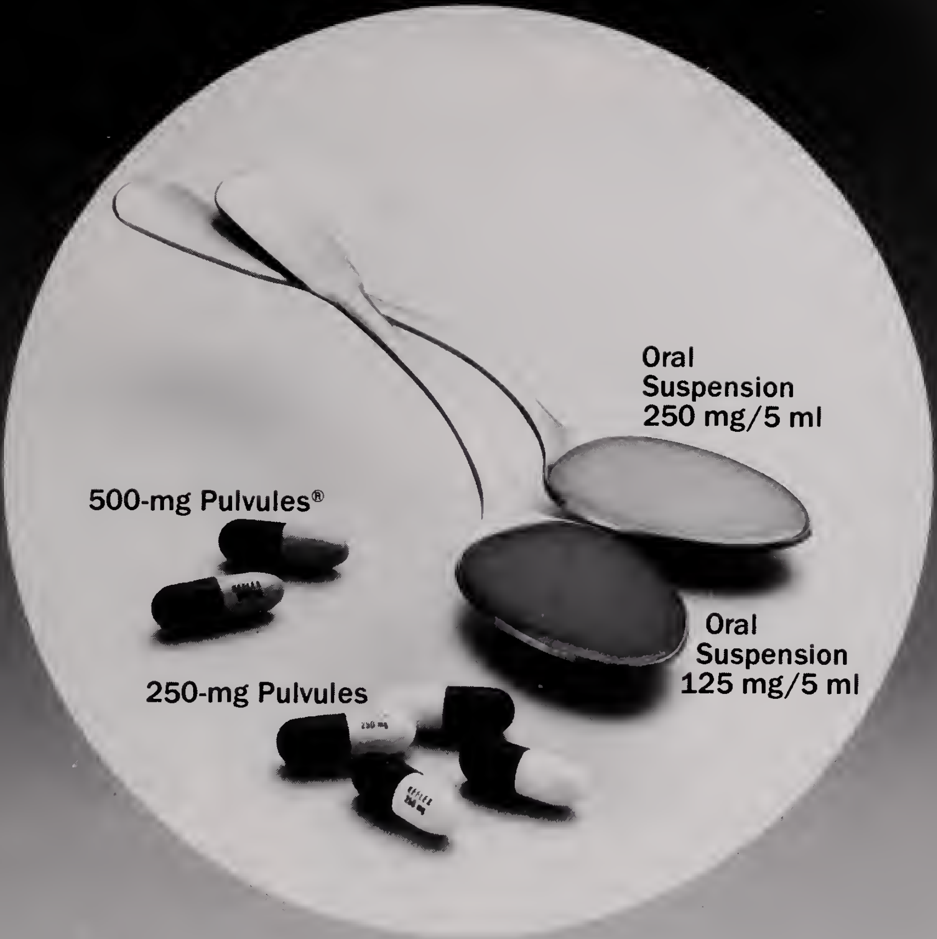
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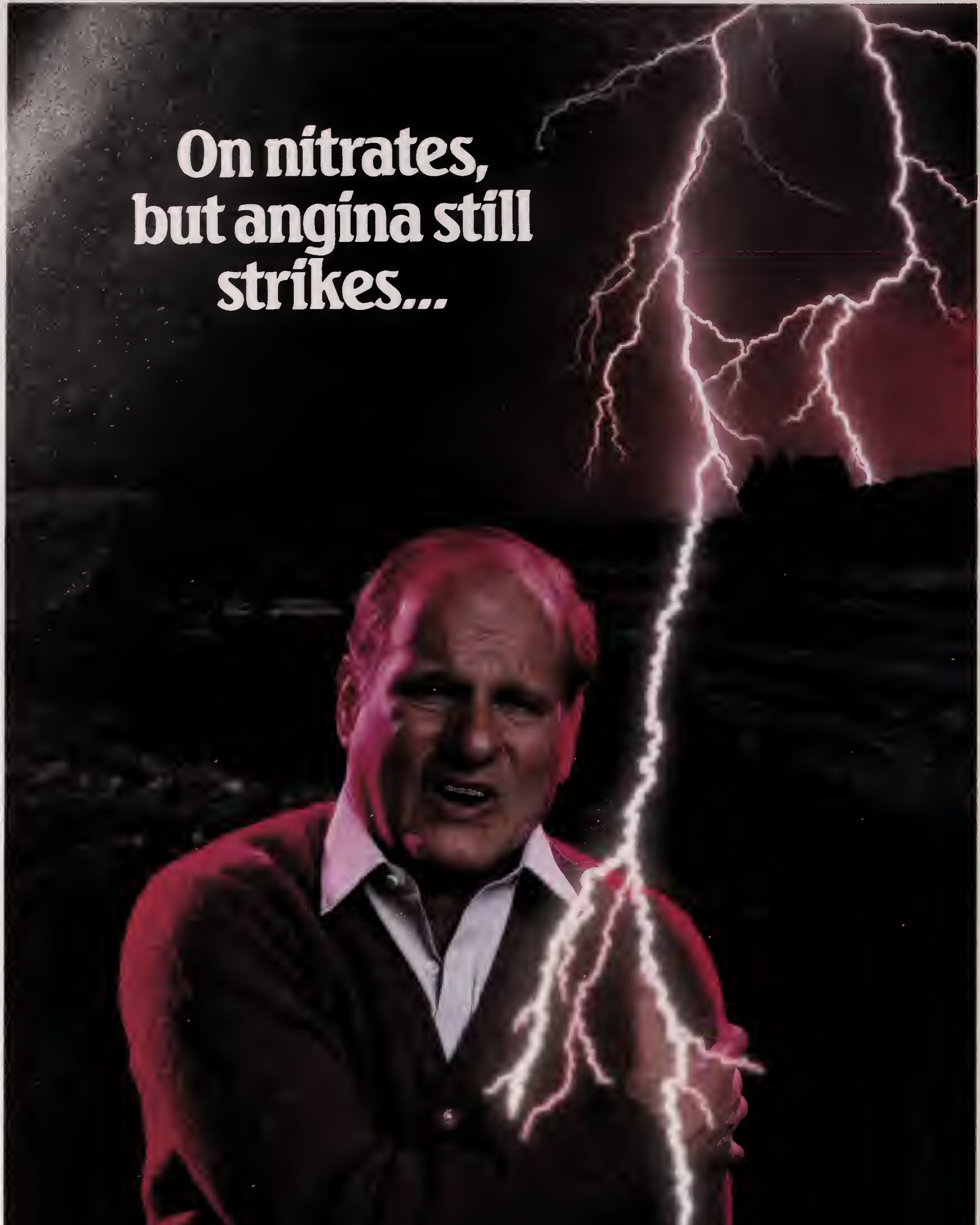
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Elevations of transaminases with and without concomitant elevations in alkaline phosphatase and bilirubin have been reported. Such elevations may disappear even with continued treatment; however, four cases of hepatocellular injury by verapamil have been proven by rechallenge. Periodic monitoring of liver function is prudent during verapamil therapy. Patients with atrial flutter or fibrillation and an accessory AV pathway (e.g. W-P-W or L-G-L syndromes) may develop increased antegrade conduction across the aberrant pathway bypassing the AV node, producing a very rapid ventricular response after receiving ISOPTIN (or digitalis). Treatment is usually D.C.-cardioversion, which has been used safely and effectively after ISOPTIN. Because of verapamil's effect on AV conduction and the SA node, 1° AV block and transient bradycardia may occur. High grade block, however, has been infrequently observed. Marked 1° or progressive 2° or 3° AV block requires a dosage reduction or, rarely, discontinuation and institution of appropriate therapy depending upon the clinical situation. Patients with hypertrophic cardiomyopathy (IHSS) received verapamil in doses up to 720 mg/day. It must be appreciated that this group of patients had a serious disease with a high mortality rate and that most were refractory or intolerant to propranolol. A variety of serious adverse effects were seen in this group of patients including sinus bradycardia, 2° AV block, sinus arrest, pulmonary edema and/or severe hypotension. Most adverse effects responded well to dose reduction and only rarely was verapamil discontinued. **Precautions:** ISOPTIN should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of excessive pharmacologic effects. Studies in a small number of patients suggest that concomitant use of ISOPTIN and beta blockers may be beneficial in patients with chronic stable angina. Combined therapy can also have adverse effects on cardiac function. Therefore, until further studies are completed, ISOPTIN should be used alone, if possible. If combined therapy is used, close surveillance of vital signs and clinical status should be carried out. Combined therapy with ISOPTIN and propranolol should usually be avoided in patients with AV conduction abnormalities and/or depressed left ventricular function. Chronic ISOPTIN treatment increases serum digoxin levels by 50% to 70% during the first week of therapy, which can result in digitalis toxicity. The digoxin dose should be reduced when ISOPTIN is given, and the patients should be carefully monitored to avoid over- or under-digitalization. ISOPTIN may have an additive effect on lowering blood pressure in patients receiving oral antihypertensive agents. Disopyramide should not be given within 48 hours before or 24 hours after ISOPTIN administration. Until further data are obtained, combined ISOPTIN and quinidine therapy in patients with hypertrophic cardiomyopathy should probably be avoided, since significant hypotension may result. Clinical experience with the concomitant use of ISOPTIN and short- and long-acting nitrates suggest beneficial interaction without undesirable drug interactions. Adequate animal carcinogenicity studies have not been performed. One study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. *Pregnancy Category C:* There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor and delivery only if clearly needed. It is not known whether verapamil is excreted in breast milk; therefore, nursing should be discontinued during ISOPTIN use. **Adverse Reactions:** Hypotension (2.9%), peripheral edema (1.7%), AV block: 3rd degree (0.8%), bradycardia: HR < 50/min (1.1%), CHF or pulmonary edema (0.9%), dizziness (3.6%), headache (1.8%), fatigue (1.1%), constipation (6.3%), nausea (1.6%), elevations of liver enzymes have been reported. (See *Warnings.*) The following reactions, reported in less than 0.5%, occurred under circumstances where a causal relationship is not certain: ecchymosis, bruising, gynecomastia, psychotic symptoms, confusion, paresthesia, insomnia, somnolence, equilibrium disorder, blurred vision, syncope, muscle cramp, shakiness, claudication, hair loss, macules, spotty menstruation. **How Supplied:** ISOPTIN (verapamil HCl) is supplied in round, scored, film-coated tablets containing either 80 mg or 120 mg of verapamil hydrochloride and embossed with "ISOPTIN 80" or "ISOPTIN 120" on one side and with "KNOLL" on the reverse side. Revised August, 1984. 2385

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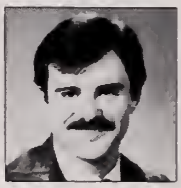

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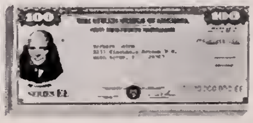

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Refractory Choledocholithiasis Treated Nonoperatively by Combined Endoscopic Sphincterotomy and Percutaneous Transhepatic Drainage: Report of a Case

IRWIN WEISMAN, M.D., Ph.D.* and STEPHEN GILBERSTADT, M.D.†

A case of refractory choledocholithiasis treated with a combined percutaneous transhepatic and endoscopic approach in a high risk surgical patient is reported. Nonoperative resolution required endoscopy with sphincterotomy, percutaneous cannulation of the common hepatic and common bile ducts and duodenum, infusion of mono-octonoin, and, finally, stone basketing via the percutaneous tract.

Diagnosis and nonoperative treatment of retained common bile duct stones by endoscopic retrograde cholangio-pancreatography (ERCP) and endoscopic sphincterotomy in patients with a previous cholecystectomy has become commonplace.[1] The endoscopist may also place biliary catheters into the common duct for infusion of stone dissolving agents or manipulate balloon tip catheters into the common bile duct through the sphincterotomy site in order to dislodge stones. On occasion, anatomical considerations combined with gross choledocholithiasis may prevent catheter manipulation through the endoscope. Furthermore, the patient may not tolerate surgical intervention. The purpose of this report is to point out an alternative approach, percutaneous transhepatic biliary drainage (PTBD), a radiologic procedure usually reserved for decompressing malignant or endoscopically inaccessible biliary obstruction[2] in poor surgical candidates. Here we document a case in which refractory choledocholithiasis was successfully treated nonoperatively in a high risk patient by combining the techniques of PTBD[2-4] and endoscopic sphincterotomy.

Case Report

A 78-year-old male with known common duct stones was admitted to the hospital with acute abdominal pain. Two-and-a-half years previously, the patient had presented with refractory cholelithiasis and jaundice. A cholecystectomy with common duct exploration was performed. Numerous stones and debris were removed from the common duct. A month following surgery a Burhenne procedure[4] was performed and 3 residual stones were removed. After extraction, a T-tube cholangiogram showed no evidence of stones. About 2 years postoperatively, jaundice recurred and an ERCP showed multiple common duct stones (Figure 1). An endoscopic sphincterotomy of about 15 mm in length was made. Attempted endoscopic stone removal was unsuccessful. The patient was sent home to convalesce but returned a week later with acute abdominal pain. ERCP was repeated. The sphincterotomy was found to be patent, but stones had impacted in the distal common duct. It was impossible to introduce a drainage tube or disimpact the stones endoscopically.

The patient had other medical problems including long-standing insulin-dependent diabetes mellitus, treated hypothyroidism, and a 6-month-old myocardial infarct with chronic congestive heart failure. Because of the high surgical risk, it was elected to attempt percutaneous placement of a common bile duct drainage catheter.

After opacification of the biliary tree using the percutaneous transhepatic technique,[2] a peripheral branch of the right hepatic duct was punctured and catheterized under fluoroscopy. A pigtail type catheter was easily manipulated around the stones in the common bile duct, through the sphincterotomy site, and into the duodenum, where it was anchored in a position allowing both external and antegrade drainage of bile. Over a two-week period, the patient's bilirubin dropped from 13 to 2 mg/dL. A cholangiogram carried out immediately after the cannulation procedure showed at least 2 and possibly 3 stones remaining in the common bile duct, the largest of which measured approximately 1.5 cm in diameter (Figure 2). Mono-octanoin was infused via the percutaneous catheter at 3 cc per hour for a total of 12 days. The infusion was well tolerated.

A follow-up cholangiogram showed little change in stone size. Percutaneous basketing of stones was then performed. The percutaneous tract was dilated and a stone basket passed into the

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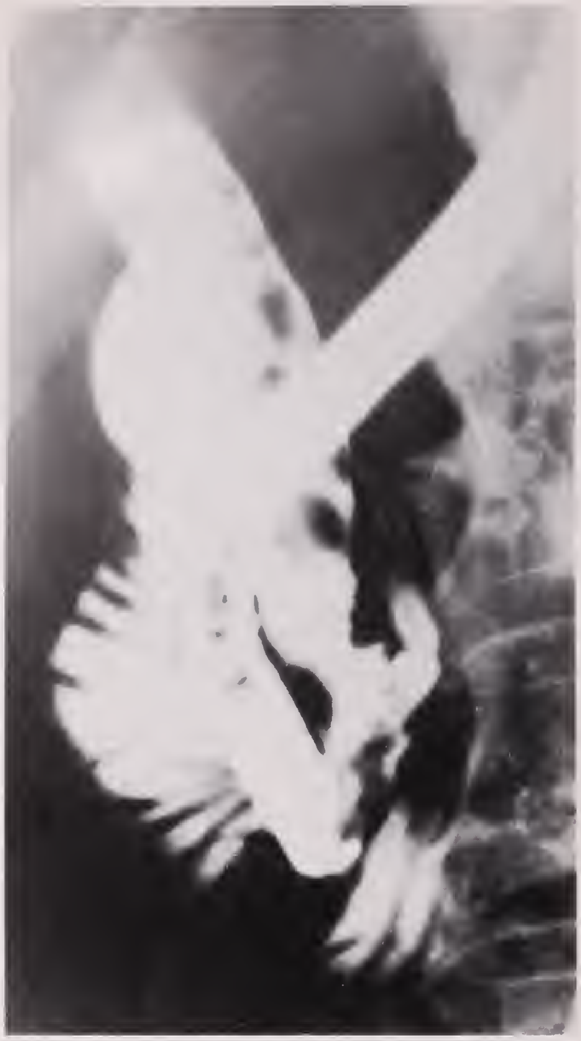

Figure 1 - Multiple filling defects consistent with impacted stones are present after opacification of the common bile duct following ERCP. The impacted stones remained even after a sphincterotomy.

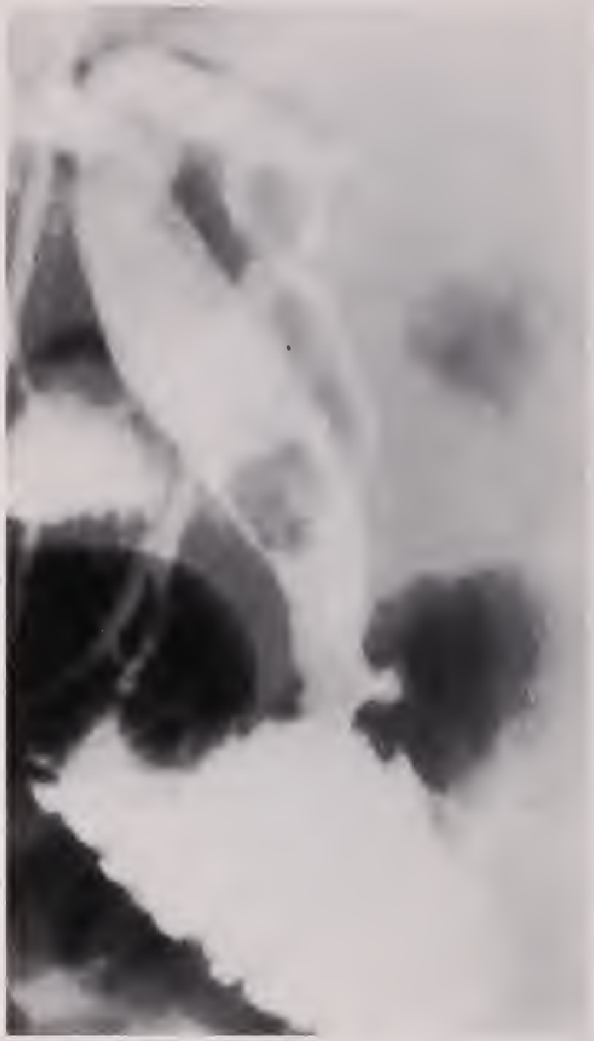

Figure 2 - A cholangiogram carried out through the biliary drainage tube shows a large retained stone in the mid common bile duct.

common bile duct. Each of the remaining stones was trapped and crushed under fluoroscopic guidance. Subsequently a Swan-Ganz catheter was advanced into the tract over a guidewire anchored in the distal duodenum until its deflated balloon was just proximal to most of the observed intraductal stone fragments. The balloon was then inflated to maximum diameter and advanced through the sphincterotomy into the duodenum, trapping and pushing the stone fragments ahead of it. This procedure was repeated several times until only minimal debris remained (Figure 3). The drainage catheter was reinserted in the tract in order to maintain patency for follow-up cholangiography, and the patient discharged. After 3 weeks, a repeat cholangiogram showed patency of the common bile duct and no further accumulation of biliary stones or sludge. The catheter was removed and the tract allowed to heal. The patient had no further biliary tract symptoms but died of unrelated causes approximately 10 months later.

It is interesting to note that the debris recovered in the basket after stone crushing had the appearance of calcium bilirubinate or earthy stones. We suspect that much of the interstitial cholesterol in the stones was dissolved by the mono-octonoin, leaving only a skeleton of pigment that crushed very easily.

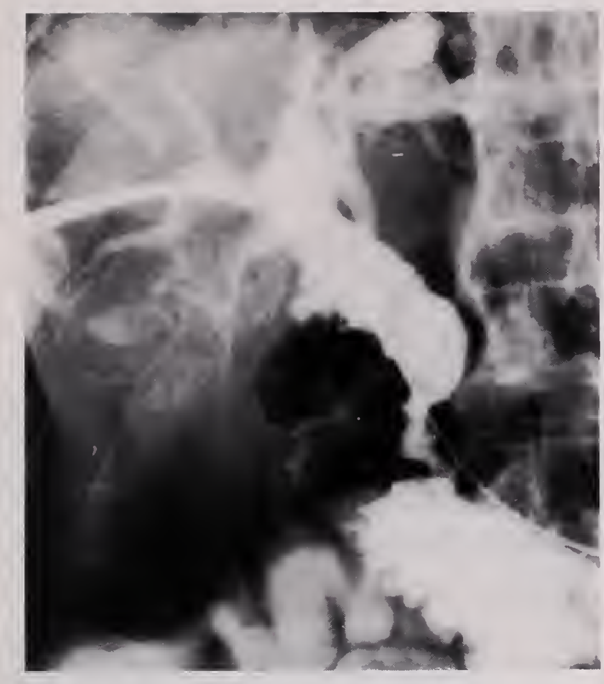

Figure 3 - After a stone basketing and crushing procedure followed by flushing, only a small amount of debris remained in the common bile duct which is now widely patent. A guidewire used to direct the Swan-Ganz balloon through the duct and duodenum is anchored at the ligament of Treitz.

Discussion

A large majority of patients with choledocholithiasis following cholecystectomy can be managed satisfactorily by ERCP and endoscopic sphincterotomy. Occasionally, as in this case, there will be a situation in which severe impaction of common bile duct stones coupled with unfavorable anatomic factors may prevent sphincterotomy or stone disimpaction procedures that require retrograde catheter manipulation. The anatomic problems include sharp angulation of the distal common bile duct at its insertion into the duodenal papilla or the presence of an intervening duodenal diverticulum between the papilla and the distal common pancreatic or bile duct. The percutaneous catheter technique developed for interventional biliary radiology and stone basketing can easily be extended to such cases refractory to endoscopic extraction. This approach provides an alternative drainage access that may allow successful stone disimpaction and clearing of the biliary tract.

Acknowledgement

We are indebted to Deanna Gunderson for assistance in preparing the manuscript and to Dr. S. H. Tsai for critical review.

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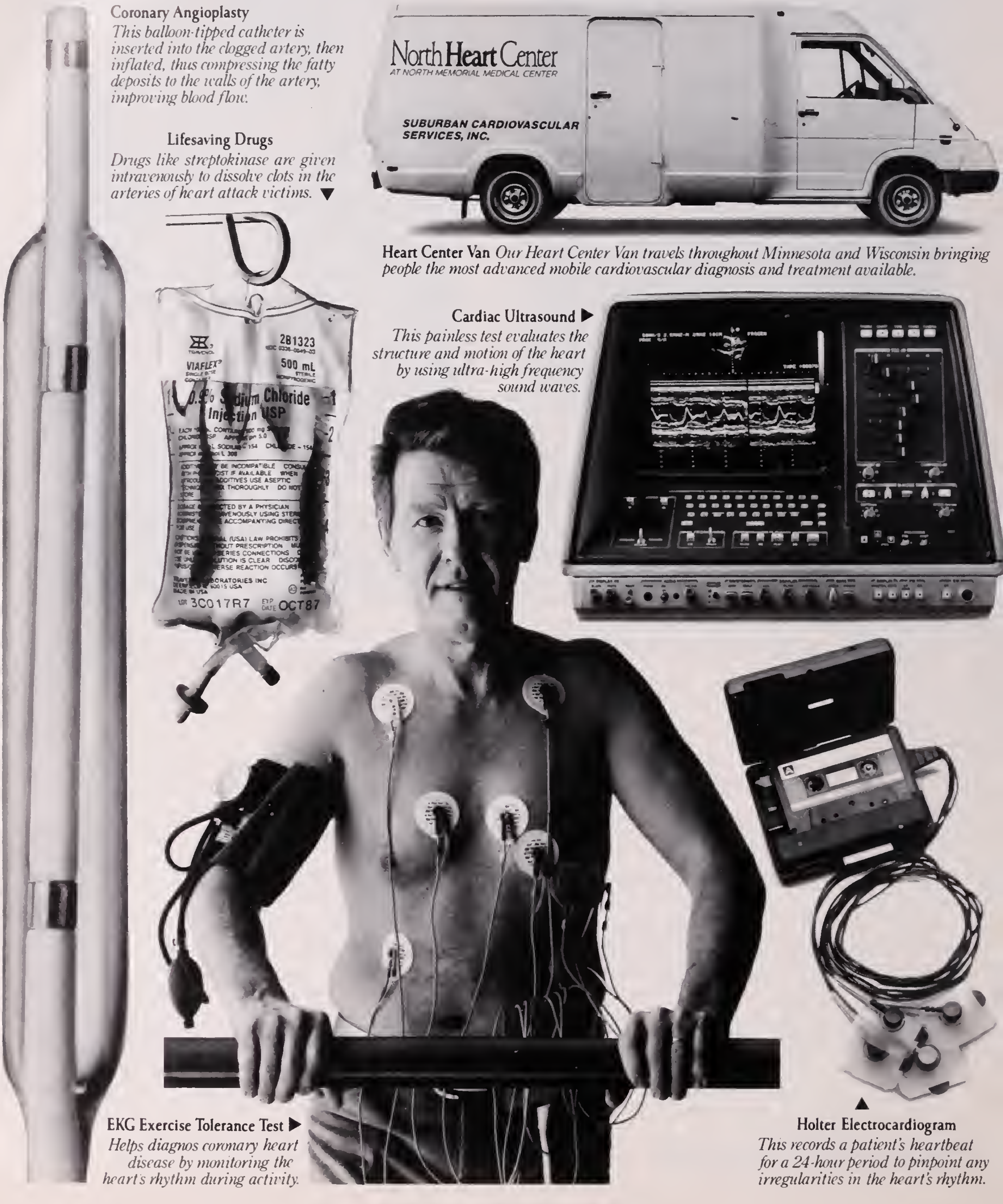
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Magnetic Resonance Imaging:

Interview with the Minnesota Radiological Society

MINNESOTA DOCTOR: We hear a lot these days about what MRI can do that other imaging tests cannot do, and yet many MRI images look at lot like CT. How is MRI different from CT scanning?

MINNESOTA RADIOLOGICAL SOCIETY: This fundamentally new approach to medical imaging uses a magnetic field and radiowaves to create images based not only on tissue density as in CT, but also based on movement and chemical characteristics of the tissue within a structure. A computer is used to create the image as in CT and thus the final pictures can often appear similar to CT scans although they contain quite different types of information.

MINNESOTA DOCTOR: Without an extensive technical discussion, how does MRI work?

MINNESOTA RADIOLOGICAL SOCIETY: When a structure is placed in a strong magnetic field, the nuclei of the atoms align within the field. If a radiowave with a specific frequency is then directed toward the structure, the energy of the radiowave is temporarily absorbed. When the incoming radiowave is turned off, this extra energy is emitted. This emitted radiowave is picked up by a radio receiver which is then coupled with a computer to form an image based on the different signals. The type of emitted radio signal is dependent on various chemical and physical characteristics of the structure.

MINNESOTA DOCTOR: How available is MRI in Minnesota?

MINNESOTA RADIOLOGICAL SOCIETY: MRI is currently available at several sites within the Twin Cities and Rochester. In time, it may be available at medium-sized or larger hospitals elsewhere within the state.

MINNESOTA DOCTOR: What is it currently used for?

MINNESOTA RADIOLOGICAL SOCIETY: The technology and clinical use of this modality remain in a state of evolution. It is being widely used for clinical diagnosis in neurologic disease involving the head, neck, and spinal cord with particular emphasis on such entities as multiple sclerosis, early detection of tumors, and other problems related to the spine. The experience of many medical centers across the country has shown MRI to be the imaging modality choice for the evaluation of multiple sclerosis, early detection of brain tumors, evaluation of soft tissue injuries in the joints, and soft tissue masses in the extremities. With the rapid advances in high detailed imaging of the spine, many believe this technique will not only rival but surpass current studies such as CT and myelography for a significant number of spinal conditions. It is also used for imaging in the pelvis and retroperitoneal area as well as diseases of medullary bone. It has shown some indications for potential use in the abdomen or chest, although many of these are still under further investigation because of the problems related to movement from the heart, diaphragm, or GI tract. It is expected that significant cardiac applications will also be developed. The investigation in clinical applications is attempting to define those entities for which MRI may be accepted or utilized as an overall examination of choice replacing rather than adding to other currently used tests.

MINNESOTA DOCTOR: What does MRI cost and why is this cost so high?

MINNESOTA RADIOLOGICAL SOCIETY: MRI charges in Minnesota currently range from $600 to $800. These devices are costly to purchase, install, maintain, and operate. The technology involves sophisticated large magnets and computers that also require significant structural alterations at the site of installation. Once installed an MRI system is operated very similarly to a CT scanning system in terms of throughput and personnel.

MINNESOTA DOCTOR: Is there reimbursement for these examinations?

MINNESOTA RADIOLOGICAL SOCIETY: Guidelines for setting reimbursement levels for magnetic resonance were issued to Medicare carriers by the

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Prepared by the Committee on Magnetic Resonance Imaging, Minnesota Radiology Society, 1986.

Health Care Financing Administration early this year. These guidelines direct Medicare carriers to offer at least partial reimbursement in many clinical areas. General reimbursement ranges for technical components are around $500 to $600, not including professional fees. A specific list of indications for guidelines of reimbursement are available from the American College of Radiology. As additional areas of study are shown to be clinically relevant, additional third party carrier reimbursement is expected in the new areas.

MINNESOTA DOCTOR: What are advantages of MRI over other technologies?

MINNESOTA RADIOLOGICAL SOCIETY: Magnetic resonance scanning offers advantages of improved structural and functional information in a variety of display projections over current imaging modalities without the use of ionizing radiation or contrast material. At present, MRI is considered a study of choice in some situations and still in a clinical state of investigation for other applications. It is predicted to become the imaging modality of choice for an increasingly large number of applications in the not too distant future.

MINNESOTA DOCTOR: What is it like for the patient to undergo MRI?

MINNESOTA RADIOLOGICAL SOCIETY: From a patient's point of view, the examination is carried out much like a CT scan. The patient lies on a table which then passes into the magnet in a tube-like structure. There is no discomfort to the patient during the scanning time which may last anywhere from 15 to 60 minutes. A small number of patients exhibit concern of claustrophobia lying on the table within the scanning gantry, but the majority of patients find this a comfortable non-invasive examination.

MINNESOTA DOCTOR: Are there any contraindications to undergoing MRI?

MINNESOTA RADIOLOGICAL SOCIETY: MRI is a safe diagnostic modality in the hands of qualified users in an appropriate medical environment. However, there are specific contraindications for certain types of patients for this examination:

1. Patients with implanted cardiac or breathing pacemakers must be excluded from MRI at the present time.
2. Some metal implants which are ferromagnetic, including some vascular surgical clips, particularly cerebral aneurysm clips, are of concern. Specific cases are best handled through the judgment of the experienced imaging physician.
3. Appropriate planning for patient resuscitation or for seriously ill patients must be taken into account in MRI site planning for handling such emergencies. Seriously ill patients can be effectively monitored without necessarily interfering with image quality or creating additional medical risks.
4. Although not considered a medical hazard, claustrophobia due to confinement within the scanning tunnel has been a problem for a small number of patients and requires supervision.
5. The lack of ionizing radiation has led to the use of MRI during pregnancy for some evaluations of the abdomen and pelvis. No ill effects to the fetus have been reported though only a few anecdotal cases have been studied. As experience is gained, it is thought that MRI may become an accepted imaging study without risk during pregnancy. Fetal motion does present a problem for producing artifact.

MINNESOTA DOCTOR: Will there be other new developments in this field?

MINNESOTA RADIOLOGICAL SOCIETY: Because of the large development costs, MRI equipment is not expected to change as rapidly as CT did in its infancy. There will be advances in magnet and software design that will continue to improve the images and patient throughput and, we hope, increase availability and lower cost. Specialized receivers called surface coils are currently being tested for improved imaging for small superficial body parts, joints, extremities, and the breast. Timing the image acquisition with cardiac and respiratory motion called "gating," has improved application in these areas. Work is also underway to create images based on less common atoms in the body other than hydrogen such as sodium, phosphorus, and fluorine. There is even interest in obtaining chemical spectroscopic recordings of tissue within the body. Overall, the future of MRI is very promising. It's certainly one of the new fields in medicine to watch.

MMIE Malpractice Claim Review

Radiology

MMIE RISK MANAGEMENT COMMITTEE:
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Allegation

Unnecessary radiation therapy due to an error in filing a C-T Scan.

Facts

The patient, a 51-year-old female, had a long history of breast cancer with metastases to the bone which had been treated with radiation and intermittent chemotherapy. On July 20, 1984, the patient underwent a C-T Scan of the head because of a speech disturbance that the primary physician felt may have been caused by metastasis to the brain.

When the films were sorted, another patient's films were placed in the jacket bearing the name of the patient. The films were then given to Dr. X, a radiologist, to read. When Dr. X read the C-T Scan, he checked the request slip against the name on the outside of the jacket but failed to check the name on the film. The C-T Scan was read as showing extensive edema and an irregular enhancing ring lesion.

On the basis of these abnormal findings, the patient started radiation therapy on August 1, 1984. Over the course of the next two weeks, she received ten radiation treatments to the brain, a total of 3000 rads.

On August 21, 1984, in the course of reviewing the C-T Scan on the other patient, Dr. X's associate discovered the mix-up in the films. The patient was notified that her C-T Scan had been normal. She promptly filed a lawsuit against Dr. X and the hospital.

Disposition

After negotiations with the plaintiff's attorney, the case was settled for a total payment of $25,000, with Dr. X and the hospital each contributing 50%.

Reasons for Settlement

The plaintiff obtained expert testimony from a neurologist to support her claim that unnecessary radiation could cause permanent brain damage. Psychometric testing showed significant organic impairment affecting foresight, planning, and the capacity to retain new information, which, according to the plaintiff's expert, was caused by the radiation treatment.

Risk Management Comments

While the damages in this case were mitigated somewhat by the plaintiff's history of cancer and chemical dependency, liability for the error was clear. During the course of investigation, it became apparent that many radiologists do not routinely check the patient's name on the film but rely on hospital personnel to correctly file the film in the jacket. As this case illustrates, the radiologist is ultimately responsible for ensuring accuracy in the films he reads and will be held liable for errors.

Errors in filing that result in patient injury are not uncommon. Physicians should take steps to ensure that proper identification of the patient is made so errors can be corrected before injury occurs. Physicians should also bring such errors to the attention of appropriate hospital personnel so actions can be taken to minimize or prevent errors in filing that can lead to patient injury.

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November 1	Bioethics Conference, St. Paul, MN
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Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

JULY, 1986

11 **Shame-Based Clients: Clinical Techniques for Working with Self and Others; Program in Human Sexuality** 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota. CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; (612) 376-7520.

11-12 **Ophthalmic Reviews** Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55095; (507) 284-2085.

13-18 **Fourth Annual Chemical Dependency and Family Intimacy Summer Institute for Counseling Professionals** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota. CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; (612) 376-7520.

17-20 **Multidisciplinary Conference on Cardiovascular Disease: Patient Problems** Abbott Northwestern Hospital, Grand View Lodge on Gull Lake, Brainerd, Minnesota. CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

21-22 **Treatment of Families in Sexual Crisis Series Workshop $5: Treatment of Adult Victims and Perpetrators** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Diane Campbell or Terri Craig, Program in Human Sexuality, 2630 University Avenue SE, University of Minnesota, Minneapolis, Minnesota 55414; (612) 376-7520.

21-22 **Treatment of Families in Sexual Crisis Series; Program in Human Sexuality** Research E. Building, 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Debbie Edwards, 2630 University Avenue SE, Minneapolis, Minnesota 55414; (612) 376-7520.

24-25 **Symposium on Nuclear Medicine** CME, Medical School, University of Minnesota, Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

July 31-August 2 **Third Annual St. Paul-Ramsey Trauma Conference** St. Paul-Ramsey Medical Center, Fox Hills Resort, Mishicot, Wisconsin. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

AUGUST, 1986

8-9 **Sexual Attitude Reassessment Seminar** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Diane Campbell, Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota 55414; (612) 376-7520.

SEPTEMBER, 1986

5-6 **Medical Directors** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

8-12 **49th Annual Radiology Course** Gastrointestinal and Abdominal Imaging and Interventional Radiology; CME, Medical School, University of Minnesota, Willey Hall/Marriott Hotel, 225 19th Avenue SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

8-19 **Fourth Annual Occupational Health and Safety Institute** School of Public Health and Office of CME; Continuing Education and Extension, University of Minnesota; Midwest Center for Occupational Health and Safety; Earle Brown Continuing Education Center, University of Minnesota, 1890 Buford Avenue, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, Continuing Education, Midwest Center for Occupational Health & Safety, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3992.

11-12 **The First 30 Minutes: A Comprehensive Review of the Diagnosis and Management of Pediatric Emergencies** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Medical Education Coordinator, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55410; (612) 874-5884.

14-19 **Critical Issues in Health Laboratory Practice** CME, Medical School, University of Minnesota; Spring Hill Center, 725 County Road 6, Orono, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota. 55455; (612) 626-5525.

18-19 **Annual Trauma and Critical Care Seminar** CME, Medical School, University of Minnesota; Pillsbury Auditorium, HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

18-20 **Teaching Geriatric Medicine** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55414; (612) 626-5525.

19 **Pediatric Update** St. Paul-Ramsey Medical Center, St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

26 **Northwestern Pediatric Society Annual Meeting** Northwestern Pediatric Society, Thunderbird Hotel, 2201 East 78th Street, Bloomington, Minnesota. CONTACT: Mark Nammacher, M.D., 6845 Lee Avenue North, Brooklyn Center, Minnesota 55429; (612) 566-9500.

26-27 **Adolescent Medicine Conference: High Risk Youth** CME, Medical School, University of Minnesota, Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

26-27 **Sexual Attitude Reassessment Seminar** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Diane Campbell, Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota 55414; (612) 376-7520.

OCTOBER, 1986

1-3 **Annual Internal Medicine Review** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

3 **Chemical Exposures: Emergency Response & Management** St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, Minnesota 55101. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101. 612/221-3980.

Problems in Family Practice The Duluth Clinic, Ltd.; Spirit of the North Theater, Fitger's on the Lake, 600 East Superior Street, Duluth, Minnesota; CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; 218/722-8364.

8-11 **Principles of Colon and Rectal Surgery** CME, Medical School, University of Minnesota, Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. 612/373-8012.

10 **Primary Care Management of Low Back Pain** Abbott Northwestern Hospital, Northstar Center, 618 Second Avenue South, Minneapolis, Minnesota; CONTACT: Sarah Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; 612/874-5461.

15-18 **The 20th Annual Orthopaedic and Trauma Seminar** Hennepin County Medical Center, Hennepin County Medical Center, Pillsbury Auditorium, 701 Park Avenue South, Minneapolis, Minnesota 55415. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office - 813, 701 Park Avenue South, Minneapolis, Minnesota 55415. 612/347-2812.

17 **Geriatric Medicine-Cardiology** CME, Medical School, University of Minnesota; Pillsbury Auditorium; Hennepin County Medical Center; 701 Park Avenue; Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

18-19 **Update in Cardiology**, Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

20-22 **Clinical Reviews** Mayo Clinic/Mayo Foundation, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905. 507/284-2085.

22-24 **Obstetrics and Gynecology Annual Autumn Seminar** CME, Medical School, University of Minnesota, Amfac Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE;, Minneapolis, Minnesota 55455. 612/373-8012.

24 **E.T. Bell Pathology Symposium** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis. CONTACT: Office of CME; Box 202 Mayo; 420 Delaware Street SE; Minneapolis, Minnesota 55455. 612/373-8012.

NOVEMBER, 1986

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center; 640 Jackson Street, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

8-9 **1st Annual Heart and Lung Institute Conference** CME, Medical School, University of Minnesota; Radisson University Hotel, 615 Washington Avenue SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

13-15 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota; (612) 221-3980.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association, St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

DECEMBER, 1986

4-6 **Coronary Heart Disease** St. Paul-Ramsey Medical Center, Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

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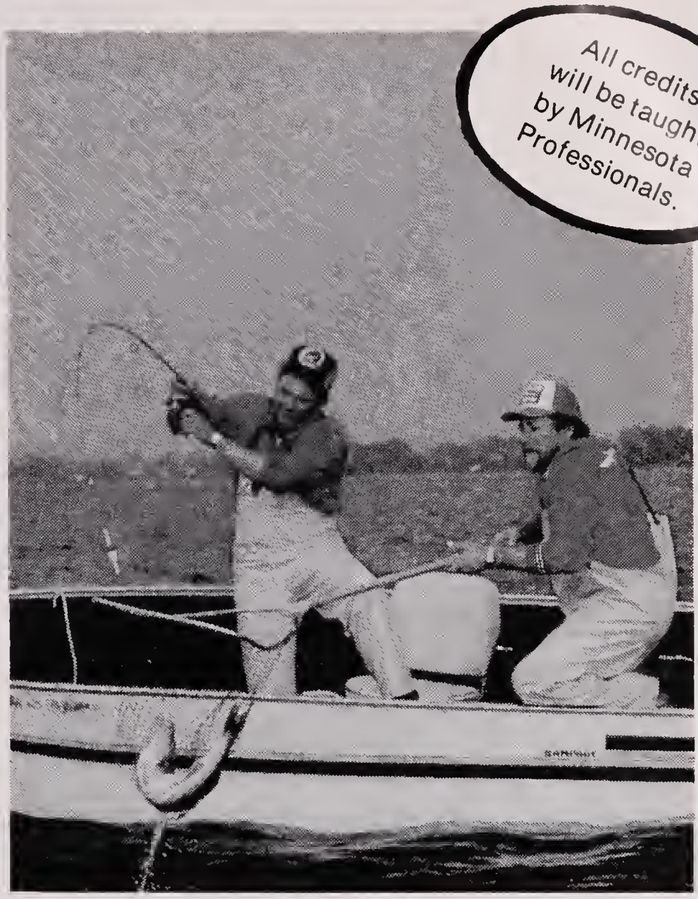

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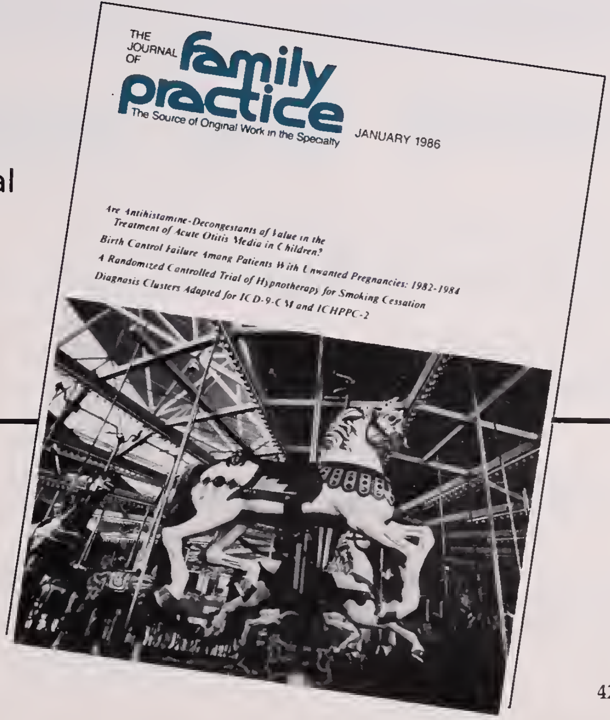

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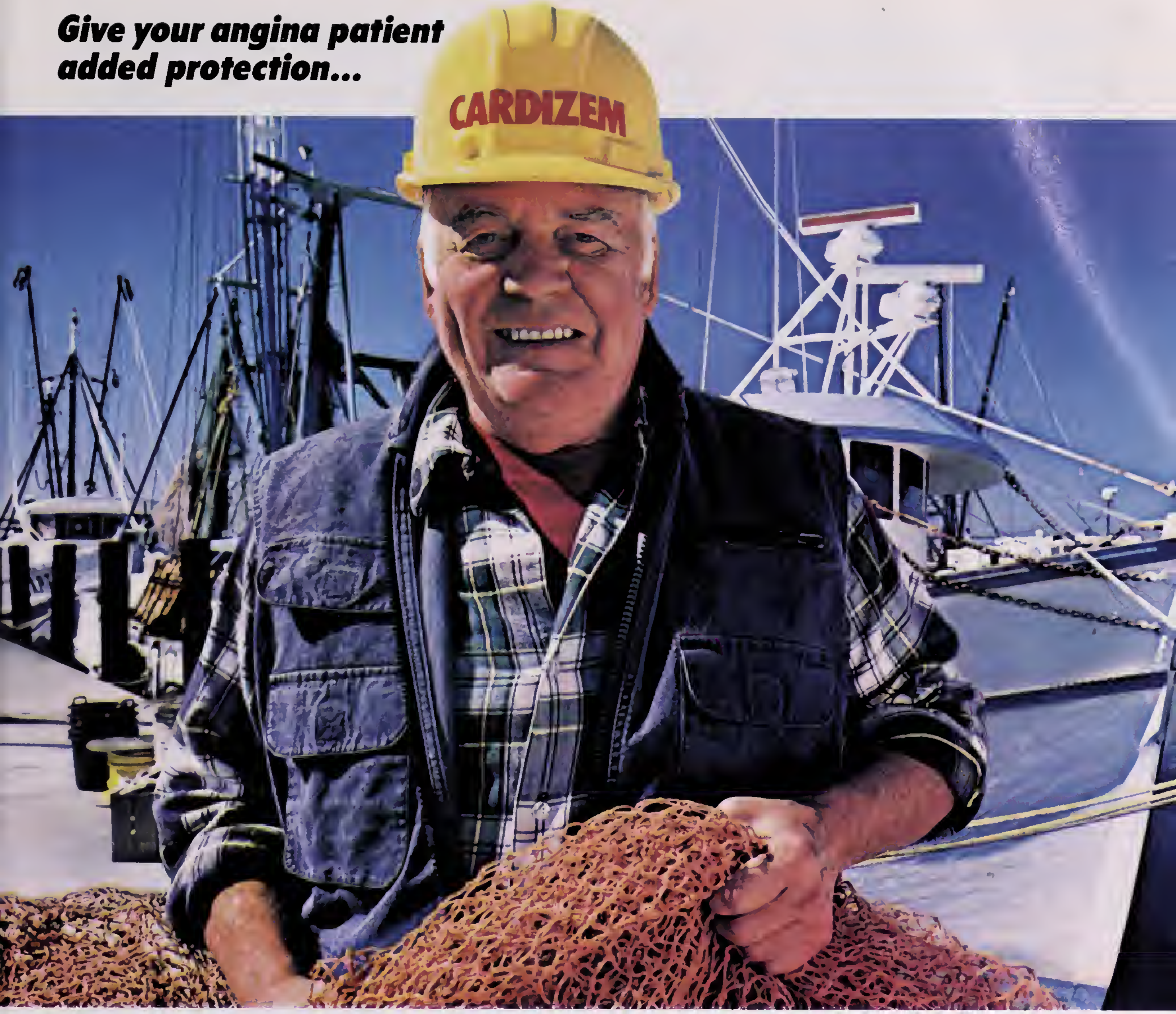

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Please see brief summary of prescribing information on the next page.

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FEWER SIDE EFFECTS IN ANTIANGINAL THERAPY

BRIEF SUMMARY

CARDIZEM® (diltiazem hydrochloride) is a calcium ion influx inhibitor (slow channel blocker or calcium antagonist).

INDICATIONS AND USAGE

1 **Angina Pectoris Due to Coronary Artery Spasm**. CARDIZEM is indicated in the treatment of angina pectoris due to coronary artery spasm CARDIZEM has been shown effective in the treatment of spontaneous coronary artery spasm presenting as Prinzmetal's variant angina (resting angina with ST-segment elevation occurring during attacks).

2 **Chronic Stable Angina (Classic Effort-Associated Angina)**. CARDIZEM is indicated in the management of chronic stable angina CARDIZEM has been effective in controlled trials in reducing angina frequency and increasing exercise tolerance

There are no controlled studies of the effectiveness of the concomitant use of diltiazem and beta-blockers or of the safety of this combination in patients with impaired ventricular function or conduction abnormalities

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic)

WARNINGS

1. **Cardiac Conduction**. CARDIZEM prolongs AV node retractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1243 patients for 0 48%) Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem

2 **Congestive Heart Failure**. Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited Caution should be exercised when using the drug in such patients.

3 **Hypotension**. Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.

4 **Acute Hepatic Injury**. In rare instances, patients receiving CARDIZEM have exhibited reversible acute hepatic injury as evidenced by moderate to extreme elevations of liver enzymes. (See PRECAUTIONS and ADVERSE REACTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals The drug should be used with caution in patients with impaired renal or hepatic function In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage In special subacute hepatic studies, oral doses of 125 mg kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg kg were also associated with hepatic changes, however, these changes were reversible with continued dosing

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM (diltiazem hydrochloride) in pregnant women only if the potential benefit justifies the potential risk to the fetus

Nursing Mothers. It is not known whether this drug is excreted in human milk Because many drugs are excreted in human milk, exercise caution when CARDIZEM is administered to a nursing woman if the drug's benefits are thought to outweigh its potential risks in this situation

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition In many cases, the relationship to CARDIZEM has not been established The most common occurrences, as well as their frequency of presentation, are edema (2.4%), headache (2.1%), nausea (1 9%), dizziness (1 5%), rash (1 3%), asthenia (1 2%), AV block (1 1%) In addition, the following events were reported infrequently (less than 1%) with the order of presentation corresponding to the relative frequency of occurrence

Cardiovascular	Flushing, arrhythmia, hypotension, bradycardia, palpitations, congestive heart failure, syncope
Nervous System.	Paresthesia, nervousness, somnolence, tremor, insomnia, hallucinations, and amnesia
Gastrointestinal	Constipation, dyspepsia, diarrhea, vomiting, mild elevations of alkaline phosphatase, SGDT, SGPT, and LDH
Dermatologic	Pruritus, petechiae, urticaria, photosensitivity
Other	Polyuria, nocturia

The following additional experiences have been noted

A patient with Prinzmetal's angina experiencing episodes of vasospastic angina developed periods of transient asymptomatic asystole approximately five hours after receiving a single 60-mg dose of CARDIZEM

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM erythema multiforme, leukopenia, and extreme elevations of alkaline phosphatase, SGOT, SGPT, LDH, and CPK However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established

OVERDOSAGE OR EXAGGERATED RESPONSE

Overdosage experience with oral diltiazem has been limited Single oral doses of 300 mg of CARDIZEM have been well tolerated by healthy volunteers In the event of overdosage or exaggerated response, appropriate supportive measures should be employed in addition to gastric lavage The following measures may be considered

Bradycardia	Administer atropine (0.60 to 1 0 mg). If there is no response to vagal blockade, administer isoproterenol cautiously
High-Degree AV Block	Treat as for bradycardia above. Fixed high-degree AV block should be treated with cardiac pacing
Cardiac Failure	Administer inotropic agents (isoproterenol, dopamine, or dobutamine) and diuretics.
Hypotension	Vasopressors (eg, dopamine or levarterenol bitartrate).

Actual treatment and dosage should depend on the severity of the clinical situation and the judgment and experience of the treating physician.

The oral LD_{50}'s in mice and rats range from 415 to 740 mg/kg and from 560 to 810 mg/kg, respectively The intravenous LD_{50}'s in these species were 60 and 38 mg/kg, respectively The oral LD_{50} in dogs is considered to be in excess of 50 mg/kg, while lethality was seen in monkeys at 360 mg/kg The toxic dose in man is not known, but blood levels in excess of 800 ng/ml have not been associated with toxicity

DOSAGE AND ADMINISTRATION

Exertional Angina Pectoris Due to Atherosclerotic Coronary Artery Disease or Angina Pectoris at Rest Due to Coronary Artery Spasm. Dosage must be adjusted to each patient's needs. Starting with 30 mg four times daily, before meals and at bedtime, dosage should be increased gradually (given in divided doses three or four times daily) at one- to two-day intervals until optimum response is obtained Although individual patients may respond to any dosage level, the average optimum dosage range appears to be 180 to 240 mg/day There are no available data concerning dosage requirements in patients with impaired renal or hepatic function If the drug must be used in such patients, titration should be carried out with particular caution

Concomitant Use With Other Antianginal Agents:

1. **Sublingual NTG** may be taken as required to abort acute anginal attacks during CARDIZEM therapy

2 **Prophylactic Nitrate Therapy** CARDIZEM may be safely co-administered with short- and long-acting nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination

3 **Beta-blockers**. (See WARNINGS and PRECAUTIONS.)

HOW SUPPLIED

CARDIZEM 30-mg tablets are supplied in bottles of 100 (NDC 0088-1771-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1771-49). Each green tablet is engraved with MARION on one side and 1771 engraved on the other. CARDIZEM 60-mg scored tablets are supplied in bottles of 100 (NDC 0088-1772-47) and in Unit Dose Identification Paks of 100 (NDC 0088-1772-49). Each yellow tablet is engraved with MARION on one side and 1772 on the other Issued 4 1 84

See complete Professional Use Information before prescribing

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References: 1. *Physicians' Desk Reference*®, ed 39. Oradell, NJ, Medical Economics Company Inc, 1985 2. Cohn PF, Braunwald E Chronic ischemic heart disease, in Braunwald E (ed) *Heart Disease A Textbook of Cardiovascular Medicine*, ed 2 Philadelphia, WB Saunders Co, 1984, chap 39 3. Schroeder JS Calcium and beta blockers in ischemic heart disease When to use which. *Mod Med* 1982; 50(Sept) 94-116. 4. Subramanian VB Comparative evaluation of four calcium antagonists and propranolol with placebo in patients with chronic stable angina *Cardiovasc Rev Rep* 1984, 5 91-104 5. Schroeder JS, Feldman RL, Giles TD, et al. Multiclinic controlled trial of diltiazem for Prinzmetal's angina. *Am J Med* 1982, 72 227-231 6. Weiner DA, McCabe CH, Cutler SS, et al The efficacy and safety of high-dose verapamil and diltiazem in the long-term treatment of stable exertional angina *Clin Cardiol* 1985; 7 648-653. 7. Shapiro W Calcium channel blockers Actions on the heart and uses in ischemic heart disease *Consultant* 1984, 24(Dec):150-159

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Physician Opportunities available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

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Family Physician or General Internist needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first-year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth which provides excellent referral and continuing education resources. Call collect (218) 834-2171 or write Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

Lutsen Sea Villa: two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $85,000. Call Jim; (612) 333-8361. (R)

Family Practitioner needed to join two FP's at the Ellsworth, Wisconsin, office of a progressive 11-physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. (R)

Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus, and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Suburban FP Group seeks associate to service rapid practice growth. Competitive salary and benefits, unique opportunity to establish your practice. Contact: Gloria M. Vierling, Sundance Medical Clinics, Ltd., 323 Naumkeag Street, P.O. Box 9, Shakopee, Minnesota 55379; (612) 445-6440. (R)

Gastroenterologist or Internist with subspecialty interest in gastroenterology (have all the equipment). Obstetrician/gynecologist, general surgeon, internist, family practice in 18-physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well-equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact: Richard W. Golly, Austin Medical Clinic, P.A., 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, P.A., 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Family Physician: Four-man family practice group needs to replace two leaving partners. Board eligible or certified desired. One-year salary with partnership thereafter. Would also consider long-term locum tenens. Small town in Central Minnesota lakes area. Unopposed family practice clinic, 150-bed regional hospital at Brainerd, 100-bed nursing home, rotate calls. Call or write: C.R. Pelzl, M.D., Pine River Medical Clinic, Pine River, Minnesota 56474; (218) 587-4416. (R)

Immediate Opening: Family Practitioner—River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes of the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman, or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona Based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

Canterbury Inn Bed & Breakfast: Rochester's unique alternative to hotel living. Victorian charm with modern comforts. Private baths, fireplace, central air conditioning, gourmet or special diet breakfast anytime, "tea-time" (wine, hors d'oeuvres, etc.) daily. Private, off-street parking, three blocks to Mayo Clinic and St. Mary's. A very special place for you, your colleagues, and your patients while in Rochester. $50/single, $60/double. 723 Second Street SE, Rochester, Minnesota 55902; (507) 289-5553. (R)

Bemidji Clinic, Ltd. offers excellent opportunities for well-trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first-year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator, or N.A. Skogerboe, M.D., Medical Director; (218) 751-1280. (R)

Family Practice — Associate needed to join four-man group, all ABFP, one member leaving soon due to health and family reasons. 65-miles north of Minneapolis, city of 2,200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact: Keith Clinic, P.A., 160 SW Second Avenue, Milaca, Minnesota 56353; or call collect (612) 983-6101. (R)

Wanted: Family Practitioner—Ob/Gyn Group practice, central Minnesota. Starting salary $55,000. Write Minnesota Medicine (755), 2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414. (R)

Family Physician and Internist needed for growing southern Minnesota clinic. Associate, solo or locum tenens position available. Will adjust to accommodate. St. James Area Family Clinic, Box 471, St. James, Minnesota 56081; (507) 375-3391. (R)

Family Practice: Northridge Family Medicine Clinic, P.A., is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Family Practitioner: Due to death of partner, a family practitioner is needed to join two remaining family practitioners in busy rural practice 175 miles west of Twin Cities. Serious candidates may obtain details about practice and community by contacting: Robert Ross, M.D., or Ronald Beyer, M.D., at Northside Medical Center; (612) 839-2516 or Richard Slieter, Administrator, Ortonville Area Health Services; (612) 839-2502 or by writing to the above at 750 Eastvold Avenue, Ortonville, Minnesota 56278. (R)

Practice in the Freedom of Montana's Big Sky Country: A family or general practitioner is needed for a small rural community with a clinic, hospital, and nursing home. Access to major technology through the hospital system support services. Excellent place to raise children. Within driving distance to national parks, skiing, hunting, and fishing. Salary and benefits negotiable. Contact: Michael R. Piper, Executive Vice President, Region I, Presentation Health System, 2101 Clark, Miles City, Montana 59301; (406) 232-6700. 3-7/86

Psychiatrist: Our exclusive client, a rapidly growing national organization committed to providing high-quality, cost-effective patient-oriented mental health and substance abuse services, seeks Adult Psychiatrist (BE/BC) for full-time staff opening in the Twin Cities. Position involves direct services, supervision, and consultation in a multidisciplinary clinical setting. Professional team includes Psychiatrists, LPs, LCPs, CCSWs, Psychiatric Nurses, and Certified Chemical Dependency Counselors. Salary to $100,000 (DOQ/DOE) plus benefit package of 20% of base salary plus bonus potential of up to 10% plus negotiable relocation expenses plus client organization will pay our agency service fee. If you think that you'd enjoy the freedom and independence of private practice with none of the financial risks, total personal and professional satisfaction, and highly attractive hours, please write or call collect in confidence on Job #3023 at: (612) 926-6584, Jerry Neren, Physician Recruiter, MedSearch Corp., Southdale Medical Building, 6545 France Avenue South, Edina, Minnesota 55435. 2-7/86

Family Practice: Hastings Family Practice, P.A., is looking for a female BC/BE F.P. to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send CV to D. R. Eckes, M.D., 1280 Ninninger Road, Hastings, Minnesota 55033 or call (612) 437-8666. 3-8/86

Thinking of Sun Belt Retirement? F.P. couple seeking GP/FP to help in office 2-3 days per week while we expand our family. Easy commute from Dallas. Adjacent to large lake and two country clubs. Call or write S. Spain, M.D., Box 667, Kemp, Texas 75143; (214) 498-2033. 3-8/86

Writing Assistance for medical journal articles, patient information brochures, marketing brochures. Ten years of experience in health care writing. Call Elaine Lampert, Freelance Writer (612) 447-5883. 3-8/86

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, MN. The hospital is well-equipped with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department, and well-equipped surgery department. Fairmont is unique with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, Minnesota 56031. 4-9/86

West Central Minnesota Area: Opportunity available for Internist, board eligible/board certified physician, in a 7-physician multispecialty group. Competitive and guaranteed first-year contract with bonus, malpractice paid, and excellent fringe benefits. Opportunity to buy into practice after first year. Contact: Morris Medical Center, Box 600, Morris, Minnesota 56267 (612) 589-3232. 2-7/86

Pediatrician: BC/BE to join a 4-Pediatrician Department in clinic with OB/GYN and Pediatrics. Excellent practice one hour from Twin Cities metro area. Salary plus excellent benefit package leading to partnership. Send CV to Cheryl Regan, Business Manager, Women & Children's Medical Center, 1520 Northway Drive, St. Cloud, Minnesota 56301. 2-7/86

Internist or Family Practitioner. Position available with established medical group in community of 6,000. Excellent facility with 49-bed JCAH hospital adjacent. Southeastern South Dakota college community offers excellent professional and recreational opportunity. Contact: Administrator, Madison Clinic, Ltd., 903 North Washington, Madison, South Dakota 57042; (605) 256-4564. 2-7/86

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FP/GP Locum Available For Work Lic. Minnesota, Wisconsin, SD, ND, Colorado, Utah, Missouri. Contact: Dr. Olin, 21450 Excelsior Boulevard, Excelsior, Minnesota 55331; (612) 474-1050. 2-8/86

Urgent Care Physician Full-time position in a new Urgent Care Clinic adjacent to a busy Emergency Department in a major teaching hospital. Board certification or eligibility in Family Practice or a primary care specialty required. Attractive salary, hours, and benefits. Contact: Steve Sterner, M.D., Emergency Medicine Dept., Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-5683. 1-7/86

Orthopedic Surgeon Opportunity for orthopod in West-Central Illinois. Kewanee Hospital, an HMP facility, services a primary and secondary population of 45,000 and offers security of non-urban setting within an hour of major cities and within 2-1/2 hours of Chicago. We are looking for an outstanding candidate and are able to offer the following: income guarantees, malpractice coverage, assistance in establishing practice, full relocation allowance, and more. Contact: Glenn A. Doyle, Administrator, Kewanee Public Hospital, 719 Elliott Street, Kewanee, Illinois 61443; (309) 853-3361. 1-7/86

Full-time and Part-time Positions available in new St. Paul Emergency Medicine Group. Competitive salary and benefits. Send CV to Director, Emergency Medical Services, Midway Hospital, 1700 University Avenue, St. Paul, Minnesota 55104. 1-7/86

Board Certified Internist, Oncologist, or Gastroenterologist (willing to do General Internal Medicine) to join expanding group of Internists with offices in downtown Minneapolis and western suburb. Excellent benefits and earning potential. Opportunity to work with young academically motivated group. Please contact: Dr. R.W. Kaufman or Dr. J.P. Kieley; (612) 339-7171. 1-7/86

Family Practice Physician Ramsey Clinic, a University affiliated, multispecialty facility in St. Paul, has immediate opportunities for several family practice physicians. Your responsibilities would involve general family medicine including obstetrics along with an ideal opportunity to be involved in academic activities within the Department of Family Medicine at St. Paul-Ramsey Medical Center. We currently have openings in several practice sites including urban, suburban, rural Wisconsin, and rural Minnesota all within 60 miles of St. Paul. For immediate consideration, please send your CV in confidence to: David J. Mersy, M.D., Satellite Medical Director, Ramsey Clinic, 640 Jackson Street, St. Paul, Minnesota 55101. An Equal Opportunity Employer. 2-8/86

Family Practice Physician Assistant NCCPA certified. Desires to join established clinic. Present duties include Family Practice, Pediatrics, GYN, Orthopedic fracture care, and minor surgery. Experience in manning branch clinic. Trained first assistant in major surgery. New Minnesota legislation allows greater versatility of PA-C's. CV on request. Mark Shoemaker: Days (218) 741-4292, Evenings (218) 229-2789. 2-8/86

Growing West Suburban Lake Minnetonka Clinic adding one full-time Pediatrician. Multispecialty: Family Practice, Internal Medicine, OB/GYN, Surgery, Orthopaedics, Urology, Ophthalmology, Pediatrics. 15-physician clinic. Three offices. Quiet, rural area, allowing easy access to downtown Minneapolis. Immediate interviewing. Forward CV to: Mound Medical Clinic, Ltd., 2208 Commerce Boulevard, Mound, Minnesota 55364, Attn: Diane Theis; (612) 472-1144. 2-8/86

Internist or Family Practitioner Position available with established medical group in community of 6,000. Excellent facility with 49-bed JCAH hospital adjacent. Southeastern South Dakota college community offers excellent professional and recreational opportunity. Contact: Administrator, Madison Clinic, Ltd., 903 North Washington, Madison, South Dakota 57042; (605) 256-4564. 1-7/86

Family Practitioner to work part-time with multispecialty group in northern suburbs of the Twin Cities. No call duties. Contact: Bradford B. McKane, Administrator, Comprehensive Medical Care, 9055 Springbrook Drive, Coon Rapids, Minnesota 55433; (612) 780-7032. 1-7/86

Wanted in Northfield, Minnesota Family Physician, BE/BC, F.P. residency graduate to join growing two-man group in Northfield. OB and surgical skills desirable. Open hospital staff. Guaranteed salary plus productivity incentive. Full partnership one year. Please contact: Dr. David C. Halvorson or Dr. Donald L. Lum, 500 South Water Street, Northfield, Minnesota 55057; (507) 645-4444. 3-9/86

OB-GYN needed for busy, modern practice with one female board certified OB-GYN in suburban St. Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

Psychiatrist board eligible/certified wanted for 11-M.D. Psychiatry Department of a University-affiliated group practice. Inpatient, outpatient, chemical dependency, prepaid, consultation, forensic, and subspecialty activities, active education, and research program. Full medical school faculty appointment, teaching and research interests desirable. Outstanding benefits, minimal on-call. Equal Opportunity Employer. Write: Minnesota Medicine (801), 2221 University Avenue, S.E., Suite 400, Minneapolis, Minnesota 55414 3-9/86

Minneapolis Suburban Practice Seeking FP to join rapidly growing family medicine practice. Guaranteed salary, benefits, and Excellent Partnership Potential. Contact: Lynn Abrahamsen; (612) 542-1037, or send resume to same at: 620 Mendelssohn Avenue, #144, Minneapolis, Minnesota 55427. 1-7/86

Pediatrician Excellent opportunity to join four pediatricians in a very active practice. Growing community, excellent hospital with teaching opportunities available. Close to Milwaukee. Contact: John R. Guy, M.D., 1111 Delafield Street, Waukesha, Wisconsin 53188; (414) 542-2536. 3-9/86

Internist Aspen Medical Group, P.A., a physician-owned/managed multispecialty group practice in Minneapolis/St. Paul is now seeking internists for immediate openings. Salary and benefits are competitive. If interested, please send CV to: Maureen K. Reed, M.D., Aspen Medical Group, 1020 Bandana Boulevard West, St. Paul, Minnesota 55108. 3-9/86

Family Practice, Internal Medicine, and General Surgery positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

Family Practice Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic P.A., 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

Family Physician wanted for rapidly growing, progressive family practice group in St. Paul. Some community service work. Contact: Tim Rumsey, M.D., 545 West Seventh Street, St. Paul, Minnesota 55102; (612) 293-9199. 2-8/86

Family Practitioner wanted for branch offices of Park Nicollet Medical Center. Northern or southern suburbs of Minneapolis. Growing active practice. Full range of benefits. Contact: Milton Hanson, M.D., Park Nicollet Medical Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 931-2922. 3-9/86

Anesthesiologist Wanted Wisconsin city on Lake Michigan. Part-time OK with other specialty. Write: P.O. Box 564, Waukesha, Wisconsin 53187; or call collect (414) 547-7069. 1-7/86

Family Practice Specialist Marshfield Clinic Department of Family Medicine is seeking a BE/BC Family Practitioner to replace a retiring colleague. The physician joining this six-member department will enjoy the support of one of the nation's largest multispecialty groups, share the philosophy of family oriented care with a preventive focus, and enjoy full hospital privileges but without the distractions of OB or surgical responsibilities. Marshfield Clinic offers an excellent salary plus extensive fringe benefits. Please send CV to: John Folz, Assistant Director, Marshfield Clinic, Marshfield, Wisconsin 54449; or call collect (715) 387-5181. 3-9/86

Nationwide Opportunities for Physicians Over 430 now available. Call (612) 786-1929 or send CV to: Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. 1-7/86

Used Medical Equipment We Buy, Sell, Appraise, Liquidate, and Consign Used Equipment. From one piece to a whole hospital. Contact: Bob Godar at Scientific Locators, P. O. Box 29231, Brooklyn Center, Minnesota 55429; (612) 566-4953. 3-9/86

Neurosurgeons One or two American trained, Board Certified/Eligible Neurosurgeons needed by our 150-member multispecialty (one neurosurgeon) Medical Staff and Hospital in St. Cloud, Minnesota. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/

St. Paul. The Hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R. J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

NEONATOLOGIST Board Certified/Board Eligible American trained Neonatologist needed to develop a Level III Nursery in Central Minnesota. Active support by 9-member Pediatric Department. Complete fully equipped Respiratory Department. Excellent Nursery Facility and Equipment. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The Hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R. J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

PHYSIATRIST A Medical Director is needed for our Rehabilitation Unit who is an American trained, Board Certified/Eligible Physiatrist. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota, 70 miles northwest of Minneapolis/St. Paul, with a 150-member multispecialty medical staff. St. Cloud Hospital is a Level II trauma and emergency facility. The Rehabilitation Unit has a large (200,000 population) referral area. The present rehabilitation unit is DRG exempt, modern, fully equipped, staffed with 40 professionals (including P.T., O.T., speech pathologist, T.R.) with an outstanding 16-year history and is actively supported by the Medical Staff. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R. J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

Cover Photograph

Canoe Country

Carl M. Kjellstrand, M.D., took the cover photograph of a Seliga canoe last summer on Flour Lake in the Boundary Waters Canoe Area. He used an Olympus-2S with an Auto-S Zuiko 50mm F 1.4 lens.

Dr. Kjellstrand is a professor of Medicine and Surgery at the University of Minnesota Medical School and attending physician at the Hennepin County Medical Center.

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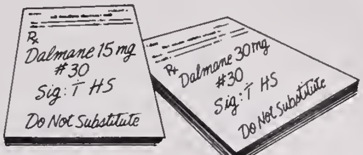
References: 1. Kales J, *et al: Clin Pharmacol Ther 12* 691-697, Jul-Aug 1971. **2.** Kales A, *et al. Clin Pharmacol Ther 18*:356-363, Sep 1975. **3.** Kales A, *et al. Clin Pharmacol Ther 19* 576-583, May 1976. **4.** Kales A, *et al: Clin Pharmacol Ther 32*:781-788, Dec 1982. **5.** Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc 27* 541-546, Dec 1979. **6.** Dement WC, *et al: Behav Med*, pp. 25-31, Oct 1978. **7.** Kales A, Kales JD: *J Clin Psychopharmacol 3*:140-150. Apr 1983. **8.** Tennant FS, *et al*: Symposium on the Treatment of Sleep Disorders, Teleconference, Oct 16, 1984. **9.** Greenblatt DJ, Allen MD, Shader RI: *Clin Pharmacol Ther 21*:355-361, Mar 1977.



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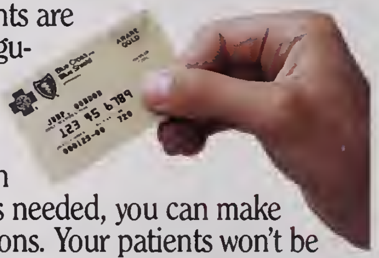

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President's Letter

To Mandate or Not, To Participate or Not

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

Over the years, these general issues have produced more debate than any at the Minnesota Medical Association. Both involve basic questions of individual rights versus societal behavior and the corollary question of individual versus collective expense.

Examples of *Mandate or Not* include seat belts, motorcycle helmets, preschool screening and vaccination, birth control programs, alcohol blood levels, and smoking bans.

Examples of *Participation or Not* include health planning through HSAs, PSRO, and PRO through the Foundation for Health Care Evaluation; and participation with Blue Cross Blue Shield and Medicare, Minnesota Health Care Coalition, and state Department of Human Services programs.

Mandate or Not revolves around infringement on individual rights through Big Brother type activities. This requires regulation by regulators with bureaucratic mentality and generally raises the cost of the activity to pay the multiple salaries of those involved in complicating the process. **The MMA is generally composed of unrepentant individualists. Mandating is anathema to their very existence, yet the MMA has policy positions that mandate some regulations for the above list.**

How do we reconcile this? Usually after considerable debate, we rationalize that some rules are necessary to contain individual destructive behavior and restrain the general public expense. Where possible, we prefer education, but often education alone doesn't get the job done. Sometimes we have to say that 55 miles per hour is fast enough on our highways.

Participate or Not frequently polarizes us more than mandating. Two attitudes prevail. One attitude says that under no circumstances should we participate because we have nothing to gain and everything to lose. The regulators will always do what they intend anyway. Our participation adds credibility to an unneeded and unwanted process.

The other attitude says that we can only influence those events in which we participate, and **if one wants credibility in the negotiating process, one must have one's feet under the bargaining table.** In recent years, the MMA has chosen to participate more times than not. Whether this has been useful is difficult to prove as there is no way to compare it with what might have been.

At times, the general membership has directed the officers on these questions through House of Delegates actions. Usually the officers have been instructed to mandate and participate. However, if the membership feels differently about this, delegates to the House should be alerted by their constituencies. This would result in a very different budget and a very different direction for the Minnesota Medical Association. **At least on the front end, participation is expensive; standing aside is inexpensive for the Minnesota Medical Association.**

Our organization is one that does not answer to anyone but ourselves. It is up to us to direct how much we participate and to what extent we support moves to mandate. However, because we physicians have said the mission of our organization includes—along with protection and representation of physician interests—working to better the health and well-being of Minnesota residents, we must also consider our patients in these deliberations.

Through the House of Delegates, this organization continues to exist at the direction of physicians. As a physician, it is up to *you* to voice your opinion on whether and how much we should participate in the increasingly complex environment in which we practice *and* whether or not our decision to support more mandates on the individual are, indeed, in the best interest of our patients, the public.

Osteosarcoma: State of the Art

FRANKLIN H. SIM, M.D.[*], LESTER E. WOLD, M.D.[†],
JOHN W. BEABOUT, M.D.[#], PETER C. AMADIO, M.D.[*],
DOUGLAS J. McDONALD, M.D.[§]

This review discusses the new developments and techniques that promise utility and restoration of function in patients with osteosarcoma. Treatment should be individualized to the needs of the patient.

Introduction

Dr. Sim: One of the most challenging areas in orthopedic oncology continues to be the management of osteosarcoma. In 1967, the results in more than 600 cases of osteosarcoma were reported by Dahlin and Coventry.[1] Experience at our institution has now grown to more than 1,000 cases, and significant advances in the clinical and pathologic understanding of osteosarcoma have been made. These developments include a better understanding of the histologic criteria for diagnosis, better clinical staging procedures, improved surgical techniques, and the use of adjuvant treatment programs. Clinicopathologic correlation is essential to the understanding of osteosarcoma.

Clinicopathologic Correlations

Dr. Wold: Osteosarcoma is not a homogeneous disease.[2-4] Subtypes exist within the overall group of osteosarcomas. As with many disease processes, the variants of osteosarcoma can be subclassified on the basis of clinical, gross pathologic, or micropathologic data. Osteosarcoma arising in Paget's disease[5] is an important clinical variant with a grave prognosis. Postradiation osteosarcoma is another important clinical variant[6] because the patient is at risk not only from the postradiation sarcoma but also from the disease process for which the radiation was given. Osteosarcoma of the jaw is also an important clinical variant to distinguish because the lesion is better differentiated and patients have a better prognosis than do patients with high-grade intramedullary tumors.

Osteosarcoma also can be differentiated on the basis of its gross features—whether it involves the surface of bone or the intramedullary cavity. One of the osteosarcomas associated with a good prognosis is periosteal osteosarcoma,[7] a lesion that tends to involve the diaphysis of the tibia or femur. This juxtacortical osteosarcoma, which by definition lacks intramedullary involvement, histologically demonstrates abundant cartilaginous differentiation and is intermediate in grade. Another variant of osteosarcoma that is juxtacortical in location is the parosteal osteosarcoma.[8] The posterior distal femur is the most frequent site for this lesion. As with the periosteal osteosarcoma, the parosteal osteosarcoma lacks medullary involvement. The parosteal osteosarcoma is a well-differentiated tumor and occasionally is mistaken for osteochondroma. However, histologically the tumor can be differentiated from osteochondroma because osteochondroma has fatty or hematopoietic marrow between the bony trabeculae, whereas parosteal osteosarcoma has a fibrous stroma with mild cytologic atypia.

A lesion that occurs within the medullary canal but that also has a good prognosis is the low-grade central or intraosseous well-differentiated osteosarcoma.[9] This tumor is frequently mistaken for fibrous dysplasia because of its radiographic appearance. Histologically, the tumor has features similar to those of parosteal osteosarcoma. Because it has a better prognosis, this variant must be separated not only for treatment purposes but also for the purposes of analysis of therapy.

Some variants of intramedullary osteosarcoma have a prognosis as bad if not worse than that for the usual intramedullary osteosarcoma. The most common variant is the telangiectatic osteosarcoma,[10] a lesion that looks grossly like a blood-filled cyst and can be mistaken pathologically for an aneurysmal bone cyst. Postradiation sarcoma may have a somewhat poorer prognosis because patients with this lesion not only are at risk for the osteosarcoma but also from the underlying malignancy for which they received radiation.

Dr. Sim: While important advances have been made in clinical staging of osteosarcomas, advances also have been made in detecting the occult systemic disease and in imaging the primary tumor.

Radiographic Findings

Dr. Beabout: One of the main goals in the imaging of osteosarcoma is to separate the unusual tumors

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Oncology Grand Rounds, March 27, 1985.

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from the conventional intramedullary osteosarcomas, which account for about 75% of osteosarcomas. The plain radiograph is the most helpful diagnostic tool. At presentation, osteosarcoma will be seen most commonly as a mixed sclerotic and lytic lesion, most frequently in the distal femur, in patients who are in the second or third decade of life (Figure 1). Occasionally, osteosarcoma may present as a purely osteolytic tumor. Another pattern that may occur is one that is predominantly osteosclerotic.

Special imaging modalities are helpful in evaluating extent of the primary tumor. Computed tomography (CT) is very helpful in visualizing the normal medullary canal and in indicating the preoperative status of the neurovascular bundle (Figure 2). In addition to evaluating the primary lesion, CT of the chest is helpful in searching for occult metastasis. Although magnetic resonance imaging (MRI) is new, it currently is about as valuable as CT in evaluating primary bone and soft-tissue tumors.

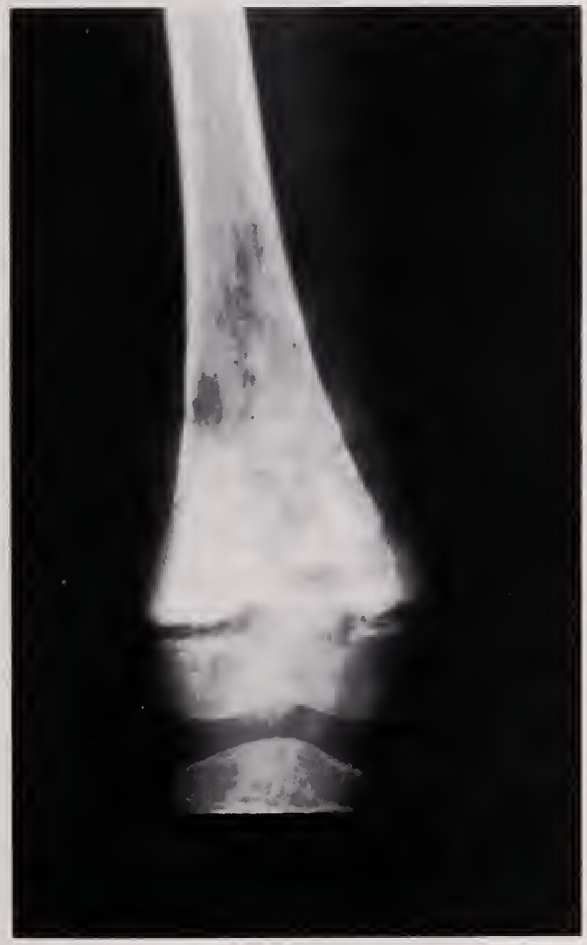

Figure 1 - Ordinary osteosarcoma with mixed sclerotic and lytic pattern involving the distal femoral metaphysis.

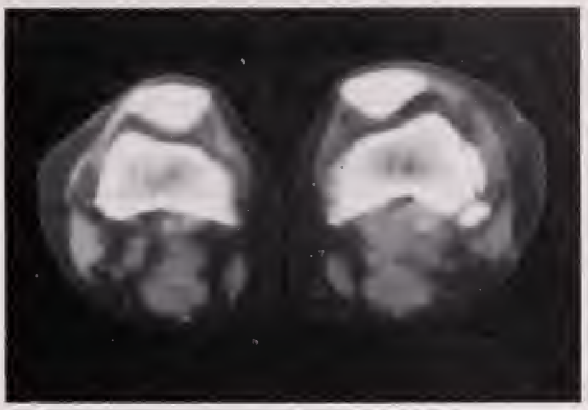

Figure 2 - CT scan of distal femur demonstrates parosteal osteosarcoma involving the surface of the left femur posterolaterally. Soft mass is intimately associated with the neurovascular bundle posteriorly. Medullary canal is normal.

Treatment

Dr. Sim: Advances in pathologic understanding and techniques for clinical staging have led to a more refined approach to treatment not only of the primary lesion but also of pulmonary metastasis, which occurs in approximately half of the patients. Many of these patients benefit from aggressive surgical treatment. In a 1978 Mayo Clinic series,[11] of 13 patients who had a single thoracotomy for resection of pulmonary metastasis, 8 were alive at the time of review; of 6 with two thoracotomies, 2 were alive; of 3 with three thoracotomies, 2 were alive; and of 4 with four thoracotomies, 3 were alive. Two patients each had a total of five thoracotomies. Currently, with this aggressive approach, a third of the patients with pulmonary metastasis can be salvaged.[11]

Adjuvant Chemotherapy

Dr. Sim: The area of most interest and controversy in the past decade probably has been the adjuvant treatment programs. Historically, surgery, which is the primary treatment of osteosarcoma, has been associated with a dismal prognosis in all large series, with a 5-year survival of 20%.[1,12-15] This poor survival was due to the development of distant pulmonary metastasis, because local tumor control could be achieved readily. For survival to be improved, effective adjuvant treatment was necessary.

The first breakthrough in chemotherapy was in 1974, when Jaffe et al.[16] showed that massive doses of methotrexate along with citrovorum factor could cause metastatic osteosarcoma to regress. Soon thereafter, a number of nonrandomized studies were reported showing that high-dose methotrexate or doxorubicin could give a projected 5-year disease-free survival of between 45% and 60%.[16-20]

When compared with historical controls, this represented a therapeutic triumph. Survival after osteosarcoma resection had improved, and many investigators attributed this to chemotherapy. Yet they were unwilling to carry out controlled prospective studies to determine the true effect of chemotherapy because it was considered unethical to withhold chemotherapy from these high-risk patients. However, some investigators believed that the entire issue was clouded by the use of historical controls and that the better results could be due to other factors, including earlier diagnosis, more aggressive treatment, better clinical staging, and even a possible change in the biology of the tumor. In addition, the occurrence of late relapses led some to believe that metastatic disease was not prevented by chemotherapy, but rather just delayed.

One of the first studies to report the generally improved survival was carried out at the Mayo Clinic.[21,22] Of 41 patients treated by surgery alone between 1972 and 1974, 62% survived and 43% were disease-free without chemotherapy. These percentages were not significantly different from those from many of the nonrandomized chemotherapy trials being reported. A prognostic index was developed to explain some of those differences (Table 1). A patient with four, five, or six of these factors has a worse prognosis than a patient with only one or two factors. Many diverse adjuvant programs were developed which, when compared with historical controls, were all considered to be effective but which, when compared with today's concurrent controls, can probably best be considered equally ineffective. There was a great disappointment with the results of chemotherapy after the initial wave of enthusiasm in the mid-1970s.

TABLE 1

Characteristics Identified as Prognostically Unfavorable	
Age	< 10 yr
Sex	Male
Diameter of tumor	> 15 cm
Cell type	Osteoblastic or chondroblastic
Duration of symptoms	0-2 mo
Site	Femur or humerus

One of the first studies to compare the results of a chemotherapy program with a concurrent surgical control without adjuvant therapy was also done at the Mayo Clinic.[23] The overall survival of 52% and the disease-free survival of 42% were not different between the patients who were treated with chemotherapy and surgery and those who were treated with surgery alone. Another prospective randomized study was carried out by the Children's Cancer Study Group in 1978. In 36 participating institutions, more than 280 patients were randomized to either high-dose or moderate-dose methotrexate. They reported a 60-month disease-free survival of 32%. There was no significant difference in overall survival or disease-free survival in patients who had received high-dose methotrexate and those who had received moderate-dose methotrexate.[24]

Two exceptions that showed significant results with adjuvant chemotherapy using a modern surgical control arm were the reports from the Dana Farber Cancer Institute[25] and from the Multi-Institutional Osteosarcoma Study Group.[26]

At the NIH consensus meeting in 1984, the results in three successive adjuvant trials at the Dana Farber Cancer Institute were reported. Their first pilot study used vincristine alone and vincristine plus methotrexate in 12 patients and achieved a disease-free survival of 42% at 10 years. In the second protocol, combining doxorubicin with vincristine and methotrexate in 22 patients, the 5-year disease-free survival was 58%. In their third protocol, increasing the dose of methotrexate, the 5-year disease-free survival was 59%. To further define the role of adjuvant chemotherapy, the Multi-Institutional Osteosarcoma Group Study was initiated in 1982. Of the 141 patients seen by the participating institutions during this 2-year period, 107 were eligible for randomization. Thirty-seven were randomized: 18 to immediate chemotherapy and 19 to observation. Of the 18 patients who had chemotherapy, only 5 had relapse, whereas 14 of the 19 with no chemotherapy had recurrence. Of patients who were not randomized, 49 received chemotherapy and 19 did not. Fifteen of the 19 who had not had chemotherapy had a relapse. Life-table analysis of the total study population showed a projected survival rate of 59% for the chemotherapy group and of 6% for the group that had not received chemotherapy. The report concluded that every patient with osteosarcoma should receive chemotherapy.

Neoadjuvant Therapy

Dr. Sim: The use of preoperative (neoadjuvant) chemotherapy is another important development in the management of osteosarcoma. In 1985, Rosen[27] reported 10-year results with four successive preoperative chemotherapy protocols. Initially, the 10 years were to be used to allow time for the manufacture of a prosthesis in limb-salvage cases, but Rosen found that it allowed the effect of the chemotherapy on the tumor to be observed. Rosen believed that the improvement in disease-free survival could be attributed to the refinements in the chemotherapy protocols based on this phenomenon. His initial T-4 protocol used high-dose methotrexate, doxorubicin, and cyclophosphamide. In the later T-7 protocol, the methotrexate dosage was increased and the single agent cyclophosphamide was switched to BCD (bleomycin, cyclophosphamide, and dactinomycin). The T-10 protocol was then instituted for the patient who did not respond to the T-7 protocol, as determined on the basis of histologic examination of the resected specimen; postoperatively, cisplatin and doxorubicin were added to the therapy of those who did not respond. In 1981, a pilot study, T-12, was done to determine the optimal lengths of chemotherapy. The responders to the T-7 protocol received only 15 weeks of total chemotherapy postoperatively, which meant they received only one treatment with BCD and two with methotrexate. On the T-4 protocol, of 33 patients, 52% remained continuously disease-free at 8 to 10 years; 37 patients on the T-7 protocol had a disease-free survival of 76% at 6 to 8 years; on the T-10 protocol, 77% of 87 patients were disease-free at 3 to 6 years; and in the pilot T-12 study with only a median follow-up of 1 year, 75% of 51 patients were disease-free. Overall, in 10 years, of 208 patients with osteosarcoma, 150 patients remained disease-free.

Neoadjuvant chemotherapy also has been associated with the increase in the enthusiasm for limb-sparing surgery. If effective, preoperative chemotherapy could safely allow for the narrower surgical margins needed for a limb-sparing resection. Some of the best results with limb salvage in osteosarcoma have been obtained with preoperative chemotherapy and are reported by Eckardt et al. from UCLA.[28] Their current protocol includes the preoperative use of doxorubicin intra-arterially and rapid-fraction radiotherapy at a dose of 1,750 rads. Resection is done 6 weeks later. Before 1980, postoperative chemotherapy was nonrandomized and included intravenously administered doxorubicin, followed by vincristine, high-dose methotrexate, and citrovorum factor. Since 1980, 28 patients have been randomized to chemotherapy and 24 to a modification of Rosen's T-10 protocol. The overall 4-year survival of this group was 42%. However, when the survival of the 52 patients seen since 1980 was analyzed, it was found that the 3-year survival was 71% for the chemotherapy group and 39% for the control group.

We are encouraged by the reports of these prospective studies involving neoadjuvant chemotherapy and have recently instituted a program of preoperative chemotherapy at the Mayo Clinic. We are hopeful that such a program will help to decrease the microscopic spread locally of tumor cells and improve the results of limb salvage in selected patients.

Limb-Salvage Techniques

Dr. Sim: Until recently, amputation was the principal treatment for the primary lesion, but this may be changing. Some controversy concerns the level of amputation; many surgeons believed that it was safer to leave a joint between the site of the tumor and the level of amputation and to remove the whole bone. This controversy has been resolved, as amputation is now routinely done through bone to a distance of 8 to 10 cm above the margin of the tumor, as determined by roentgenogram and bone scan. Stump recurrence has not been a problem.

In recent years, enthusiasm for limb salvage has increased, stimulated by enthusiasm for chemotherapy as well as by advances in the techniques of oncologic reconstruction. Patients who present with osteosarcoma must undergo a thorough evaluation prior to limb salvage. Proper patient selection is important. Patient age is important because many of the reconstructive procedures are appropriate only when the epiphyses are closed. In young patients with open epiphyses, amputation may be preferable, although prostheses designed for the growing patient have been developed which may extend the indications for limb salvage into younger age groups.[29] Location and extent of the tumor must be favorable to allow removal with a margin sufficient to prevent recurrence and yet not so extensive as to preclude restoration of useful function.

It is preferable for the tumor to be entirely intraosseous (stage IIA). However, most high-grade osteosarcomas have cortical destruction and soft-tissue extension. For limb salvage to be considered, the extension should be small and away from the neurovascular structures. Surgical resection and reconstruction with limb salvage is surgically demanding, and strict principles of oncologic surgery must be adhered to. A biopsy that contaminates other compartments or that is associated with a hematoma will preclude limb salvage.

To present a viable alternative, limb salvage must meet two criteria: comparable tumor control, so that the incidence of recurrence is the same as with amputation, and maintenance of a functional status that is superior to amputation and prosthetic fitting.

Recently, the results at our institution in a series of 49 patients with high-grade osteosarcoma (stage IIA or B) who had limb salvage have been reported.[30] During the same period, more than 500 patients with osteosarcoma were treated. In 1975, only 6% of patients with osteosarcoma underwent limb salvage. During the last 2 years, almost a fourth of the patients were treated by limb salvage. In most, a wide margin was achieved, although 8 of the patients had a marginal margin. A marginal margin was most common in the proximal femur and pelvis, where it is very difficult to achieve a wide margin, even with amputation.

Reconstruction after a massive resection presents a complex surgical problem that can be managed by various techniques. Depending on the location of the tumor, the alternatives include the use of a custom prosthesis, allograft replacement, and resection arthrodesis. Of the 49 patients in the previously mentioned series, 19 had reconstruction with a prosthesis, 6 had allografts, and 10 had autogenous bone grafting.

For lesions about the hip, prosthetic replacement has been effective in restoring the integrity of the proximal femur and in maintaining the function of the hip joint (Figure 3). To accommodate the actual amount of bone resected, the current design length of the proximal femoral replacement ranges from 80 to 250 mm. Overall experience at our institution in 65 patients with proximal femoral replacement has shown that the procedure is generally effective in restoring function and relieving pain, with more than 80% of patients having a mechanically sound prosthesis at 5 years.[31] In the pelvis, limb salvage is an important option because of the mutilating effect of a hemipelvectomy and because the margin achieved is no different than one might get with amputation. In the pelvic region, the techniques of reconstruction are demanding, and they vary with the extent of the resection and the location of the tumor. If a partial resection of the iliosacral region is done, preserving pelvic continuity, reconstruction is not necessary. If complete iliosacral resection is done, fusion of the remaining ilium to the sacrum may be accomplished by hinging the pelvis on the pubic symphysis. When the lesion involves the acetabular region, the preferred technique is to fuse the proximal femur to the ilium. The use of vascularized fibular grafts is an effective way of bridging a segmental defect. Of 9 patients with pelvic resection for osteosarcoma, 4 had vascularized fibular graft as part of their reconstruction. Another way of treating large defects is to bridge the defect and maintain stability and leg length with an allograft; this was done in 2 patients in our series.

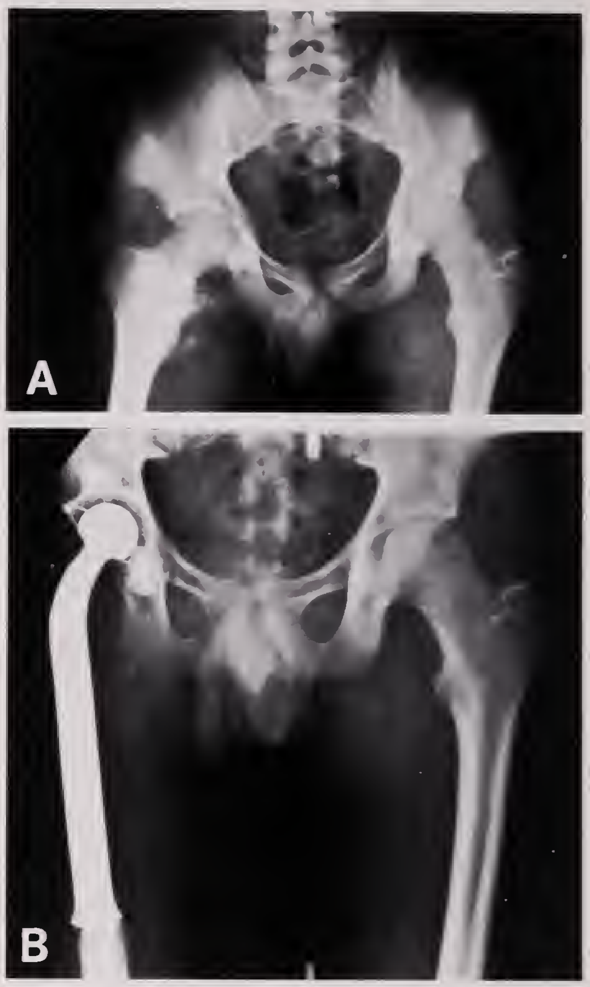

Figure 3 - Anteroposterior roentgenograms of pelvis and proximal femur. A, Showing destructive lesion of proximal right femur. Open biopsy revealed grade 4 osteoblastic osteosarcoma. B, Reconstruction utilized a 200 mm prosthesis. (From Sim FH, Bowman WE Jr, Wilkins RM, Chao EYS: Limb salvage in primary malignant bone tumors. Orthopedics 8:574, 1985. By permission of Slack Incorporated.)

A number of techniques are available to restore the continuity of a limb after resection about the knee. A custom prosthesis is effective in providing early skeletal stability as well as functional knee motion. Recent designs use a kinematic rotating hinge that is available in a wide range of sizes, with fixation enhanced by a fiber metal surface. In our overall series, 10 of 40 patients had custom prostheses that required revision at 3 years, usually because of loosening. Overall, 60% of patients can expect to have a functioning prosthesis at 8 years.[32]

While best reserved for the older patient, prosthetic replacement achieves early functional restoration, which often justifies its use in a younger patient with a high-grade life-threatening osteosarcoma.

Eight of our 49 patients had an allograft joint replacement. Although we have had an allograft bank for only 3 years, this procedure is becoming more useful because of improvement in biologic typing and mechanical selection. At present, an allograft is best reserved for patients with benign disease and is contraindicated if chemotherapy is to be used. Our preferred method of reconstruction about the knee is a segmental arthrodesis, particularly for the young, active patient. While a stiff knee is a functional handicap, a successful arthrodesis provides a long-term stable pain-free extremity. Various techniques are available to achieve the arthrodesis. The preferred technique involves hemicylindrical femoral turn-down or tibial turn-up grafts, in combination with an ipsilateral fibular graft and a Kirschner rod for fixation (Figure 4). Dual vascularized fibular grafts also have been used for larger defects. The use of a fiber metal prosthesis to provide immediate stability and fixation, as well as a scaffold for bone growth, is another promising technique. Intercalary allograft segments also can be used to span large defects. Twenty-seven patients in our series had a resection arthrodesis: 19 with local bone grafts, 6 with a fiber metal prosthesis, and 2 with an allograft intercalary segment. Complications from resection arthrodesis can be high. Our complication rate was 22%. In 1 patient, the fiber metal prosthesis broke, and 2 had infections, 1 of whom suffered a nonunion.

The rating system of the Musculoskeletal Tumor Society is used to evaluate all limb-salvage procedures (Table 2). Six parameters specific to the joint involved are rated excellent, good, fair, or poor. To have a good rating, the patient must have a good or better rating for at least five of the six parameters. Of the patients with a custom prosthesis in our series, 58% had an excellent rating and 29% had a good rating, whereas 80% of the patients with a resection arthrodesis had a satisfactory rating.

Although limb salvage can provide useful functional restoration, there are risks. In our 49 patients with osteosarcoma, among the majority who did not receive chemotherapy, the recurrence rate was 20%. Most of these recurrences were noted in the proximal femur, pelvis, and knee. About half of the patients who had a marginal margin had recurrence. However, the use of limb-salvage procedures in osteosarcoma does not appear to affect survival adversely. The 5-year survival of patients with limb salvage was 49%, compared with 54% for the 160 patients treated by amputation during the same period. These results are consistent with those from other reports. In the UCLA experience with 116 patients who underwent amputation and 78 who underwent resection, there was no difference in survival. In addition, the study showed that limb salvage was as effective as amputation in obtaining local control of the tumor, with a local recurrence rate of only 3.8%.[28]

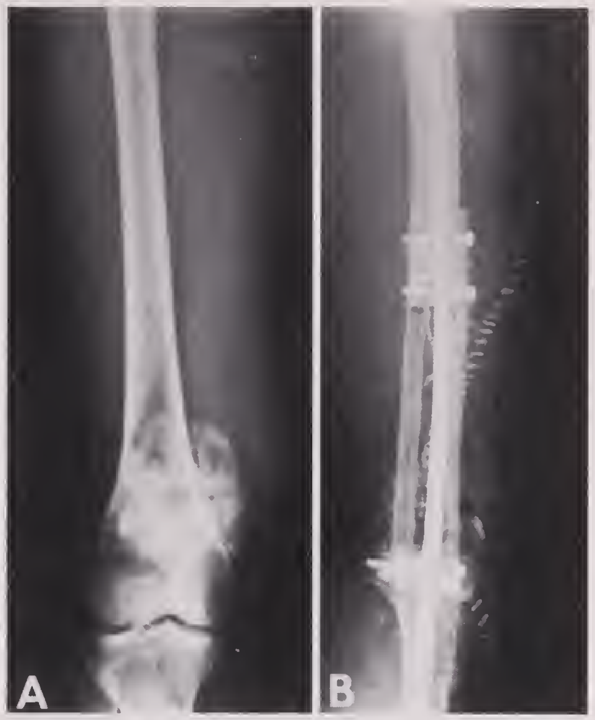

Figure 4 - Anteroposterior roentgenograms of distal femur. A, Showing large osteosarcoma. B, After resection and reconstruction (from Sim et al.[30]).

Promising results with limb salvage also have been reported from other institutions. Recently, Gebhart et al.[33] reviewed their results in limb salvage for osteosarcoma. In a group of 154 consecutive patients, also treated with preoperative and postoperative chemotherapy, there was no significant difference in survival between patients who had resection and those who had amputation. The overall local recurrence rate was 15%, but this was dramatically reduced to 6% when the duration of preoperative chemotherapy was kept to 6 months or less. Malawer,[34] from the Children's Hospital National Medical Center, reported on 33 patients who had an average follow-up of 31 months. He noted an overall survival of 77% and a local recurrence rate of only 6%, with only 4 patients subsequently requiring secondary amputation.

TABLE 2

Evaluation of Knee Function After Reconstruction (Musculoskeletal Tumor Society)*

	Rating			
Parameter	*Excellent*	*Good*	*Fair*	*Poor*
1. Motion†	>90°	60°-90°	30°-60°	0°-30°
2. Pain	None	Modest	Moderate	Severe
3. Stability/deformity	0°-5° varus-valgus instability/0°-5° varus-valgus deformity or 0°-5° extension lag	5°-10° varus-valgus instability/5°-10° varus-valgus deformity or 5°-10° extension lag	10°-20° varus-valgus instability/10°-20° varus-valgus deformity or 10°-20° extension lag	>20° varus-valgus instability/>20° valgus deformity or extension lag or habitual brace/crutch/cane
4. Strength#	10 lb for 20 sec	5 lb for 10 sec gravity	Only overcomes	Cannot overcome gravity
5. Emotional acceptance/functional activities	Enthused/unrestricted	Likes/minor restrictions	Accepts/partial disability	Dislikes/total disability
6. Complications (specify)	None (disabling)	Minor (not disabling)	Major (partially	Major (causing failure)

*From Enneking WF: A method of functional evaluation following resection of tumors. Presented at the meeting of the Musculoskeletal Tumor Society, 1983. By permission.

†Active flexion-extension of leg vs. thigh.

#Straight leg raise with knee in maximal extension.

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Postoperative (or Postsurgical) Pulmonary Embolism
A Community Analysis
Duluth, Minnesota

R. J. CAMPAIGNE, M.D., F.A.C.S.*

Pulmonary embolism is a significant cause of morbidity and mortality in this nation. More than 500,000 cases occur every year, and one of five—100,000 cases—is fatal.[1-3] Pulmonary embolism occurring after surgical procedures during a 20-year period in Duluth were reviewed.

Material

All cases of pulmonary embolism recorded during the postoperative hospital stay for the years 1961 through 1980 were extracted from the records of St. Luke's Hospital and St. Mary's Hospital and reviewed. The hospital charts of these 350 patients provided the material for this report.

In this time period, over 302,000 surgical cases requiring either a general or spinal anesthetic were performed. The incidence of pulmonary embolism was 1 per 860 cases. Of the 350 patients sustaining a postoperative pulmonary embolism, 138 died—a mortality rate of 39.4%. The distribution of cases can be seen in Table 1.

TABLE 1
Surgical Cases Pulmonary Embolism 1961-1980

St. Luke's—St. Mary's Hospitals	
Male Cases	199
Female Cases	151
Total Cases	350
Incidence Pulmonary Embolism 1/860 Cases	
Fatal Cases	138
Non-Fatal Cases	212
Mortality	39.4%
Autopsy	72.5%

Incidence

The age distribution ranged from 17 to 107 years. The youngest patient expired from pulmonary embolism related to severe trauma. The oldest died of pulmonary embolism following surgery for a hip fracture. The skewed curve can be seen in Figure 1, with the average age, 61.9 years; the mode age, 71 years.

There was a variation in the number of cases occurring during the months of the year, seen in Figure 2, with the greatest number in winter months. The reason for this phenomenon is unknown. Similarly, there appears to be an incidence increase in pulmonary embolism seen in the more northern climates.

Between 1961 and 1972, the incidence of pulmonary embolism increased by 5% per year, and, interestingly, decreased between 1972 and 1980. This decrease was primarily due to more accurate diagnosis related to the use of perfusion and ventilation lung scans, coupled with more intensive antiembolic therapy. This variation in yearly incidence can be seen in Figure 3.

Diagnosis

The diagnosis of pulmonary embolism is somewhat erratic and difficult, often due to the critical nature of the patient. Clinical suspicion is paramount to early diagnosis, particularly in the postsurgical patient. The perfusion lung scan is the safest and simplest diagnostic method. In this city, the perfusion lung scan was correct in 95% of cases, as determined by repeated scanning and/or pulmonary angiography. The postoperative patient with preexisting chronic obstructive lung disease complicates the accuracy of the scanning technique. The chest film is usually normal even in massive embolizations because of collateral blood supply and oxygen supply to the lungs. Less than half of our patients demonstrated abnormal chest X-rays. Arterial blood gases were normal in half of the cases.

Symptoms

The triad of hemoptysis, chest pain, and shortness of breath, supposedly the "hallmark" of pulmonary embolic phenomenon, was seen in only 7% of our cases. However, 80% of the patients demonstrated at least one pulmonary-related symptom or sign, such as tachypnea, dyspnea, abnormal chest film, or abnormal blood gas determinations.

Cardiac abnormalities such as tachycardia, hypertension, and abnormal EEG were present in 65% of patients.

Gastrointestinal symptoms such as nausea, vomiting, or defecation were seen in over half of the cases. Symptoms present can be seen in Figure 4. The symptoms of acute pulmonary embolism occurred on the average 9 days postoperatively (mode time of 5 days), with 80% of the cases occurring within 14 days of the surgical procedure (Figure 5).

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*General surgeon, Miller Dwan Hospital, Duluth, Minnesota

Seventy-four patients (53%) expired within 2 hours of the pulmonary insult, indicating the need for immediate diagnosis and treatment. However, further observed was the fact that if the patient makes it through the initial insult of pulmonary embolism, he will most likely survive, as seen by the decline in number of cases illustrated in Figure 6.

Surgical Distribution of Pulmonary Embolism

Figure 7 illustrates both the distribution of surgical cases and incidence of pulmonary embolism on that surgical division. General surgery accounted for 32% of the surgical procedures and 36% of the cases of pulmonary embolism. One-third of the cases of pulmonary embolism occurred following cholecystectomy and/or biliary tract procedures. Trauma was the second most frequent incident related to pulmonary embolism. Interestingly, there were no cases of pulmonary embolism related to vascular surgery. This observation has been recorded by Hirsch and may be related to the frequent use of Heparin in vascular procedures during surgery (where surgery was thought to be the actual time of initial thrombus formation).

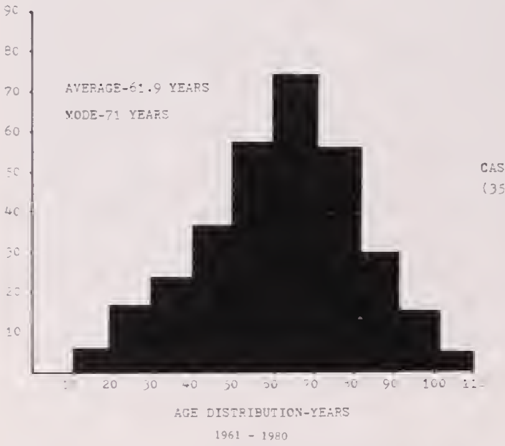

Figure 1 - Age distribution of 350 patients sustaining a postoperative pulmonary embolism from 1961 to 1980.

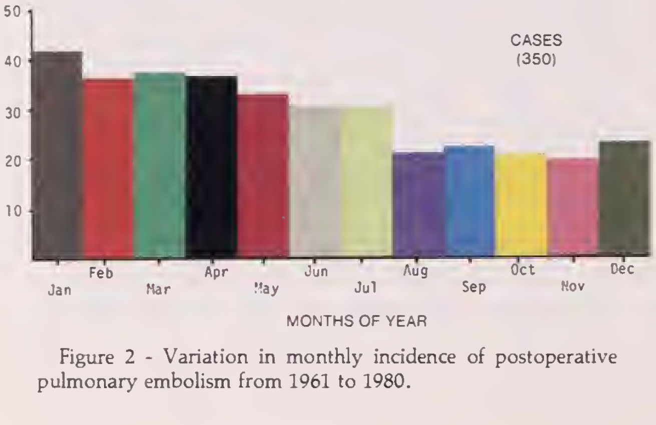

Figure 2 - Variation in monthly incidence of postoperative pulmonary embolism from 1961 to 1980.

Urology and gynecology together accounted for 36% of the surgery and only 12% of the cases of pulmonary embolism. The low incidence seen here may be due to the dorsal lithotomy position used during transurethral resections and vaginal hysterectomies when the legs are supported in the lithotomy position. This position may decrease the venous stasis in the calf veins, considered the most common site of the primary clot formation.

Neurosurgery accounted for 7% of the procedures and was accompanied by a 10% incidence of pulmonary embolism. Trauma was most frequently linked to pulmonary embolism.

Although orthopedic patients underwent 23% of the total surgical procedures, they sustained 41% of the cases of pulmonary embolism. The related factors are multiple; age of the patient and the patient's associated disease(s), all influencing the occurrence of pulmonary embolism. Over 80% of the patients had one serious disease complicating pulmonary embolism, with 50% more than two associated major disease processes. The patient with the hip fracture accounts for one-half of the cases of pulmonary embolism seen on the orthopedic service. The patient requiring a total hip and/or a total knee replacement has less than 10% of the orthopedic cases of pulmonary embolism but accounts for a similar percentage of surgical cases. The patient requiring a joint replacement procedure appears to be a more healthy one. Fractures of the long bones is the second most frequent diagnosis associated with pulmonary embolism in the orthopedic service.

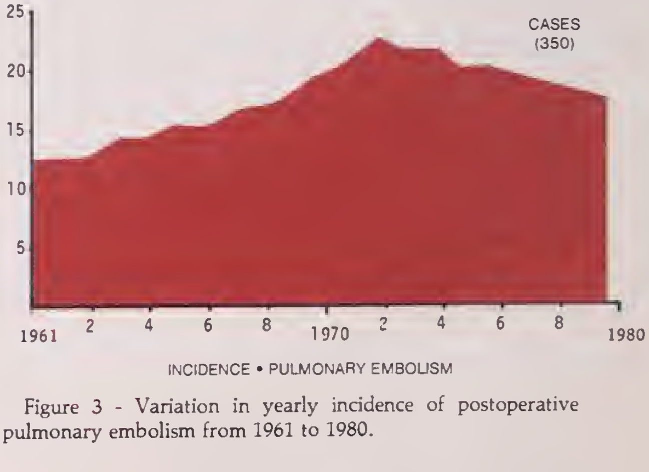

Figure 3 - Variation in yearly incidence of postoperative pulmonary embolism from 1961 to 1980.

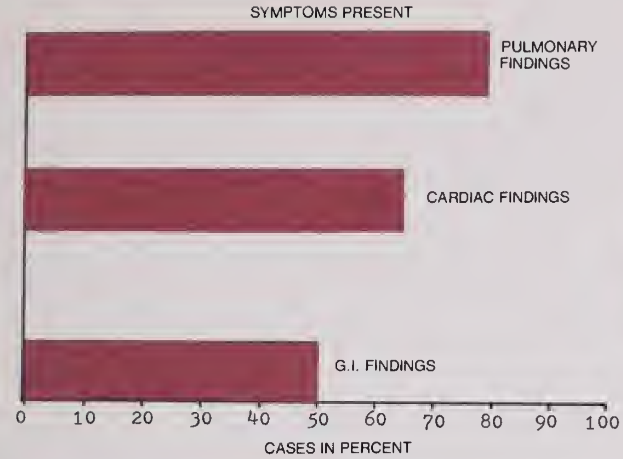

Figure 4 - Symptoms present in 350 postoperative pulmonary embolism cases.

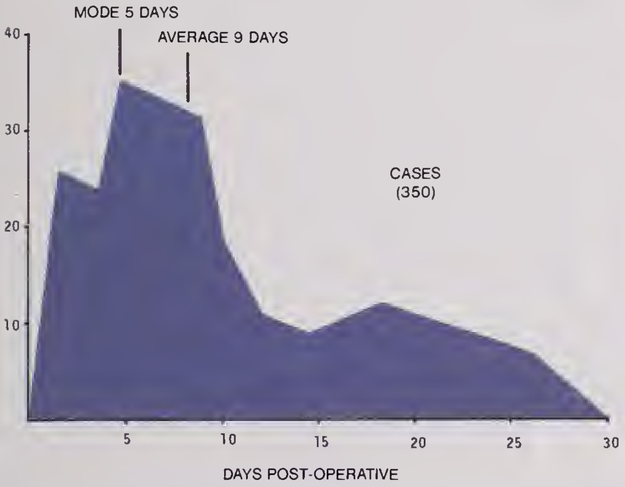

Figure 5 - Day postoperative symptoms of pulmonary embolism occurred in 350 cases from 1961 to 1980.

Treatment

Over the 20-year period studied, Heparin was (and remains) the standard therapeutic agent in the treatment of pulmonary embolism. Administration has changed from the intermittent dosage to continuous IV with a decrease in complications such as hematoma and hemorrhage. In 1978, initial work was instituted with the use of enzymes, particularly in the critical patient with gastrointestinal hemorrhage or cerebrovascular accident. Application of this method was limited in the cases reviewed here and cannot be evaluated statistically.

Because deep venous thrombosis and pulmonary embolism are essentially preventable disease processes, prophylaxis is important. General surgeons and most surgeons in other sub-specialties have been comfortable utilizing (mini) doses of Heparin, from the time of surgery to the point of ambulation. In orthopedics, aspirin or aspirin by-products are used postoperatively to prevent pulmonary embolism. However, there has been a great deal of disparity among results obtained.[4-6] Particular references have been made to the negative effect aspirin has on formulation of the red clot, which is the prime concern of the surgeon. Perhaps the ideal drug to use in orthopedic patients would be the Dextrans, which are simple and cost effective.[7] Much work is being performed at present with the ecosanoids[8] and their prevention of deep venous thrombosis and pulmonary embolism.

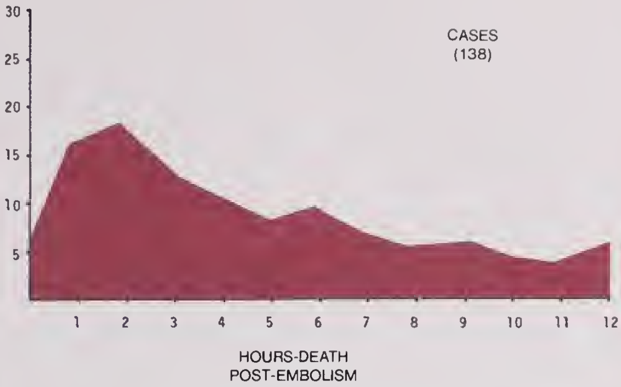

Figure 6 - Hour following pulmonary insult at which death occurred (138 patients died in 350 cases reviewed).

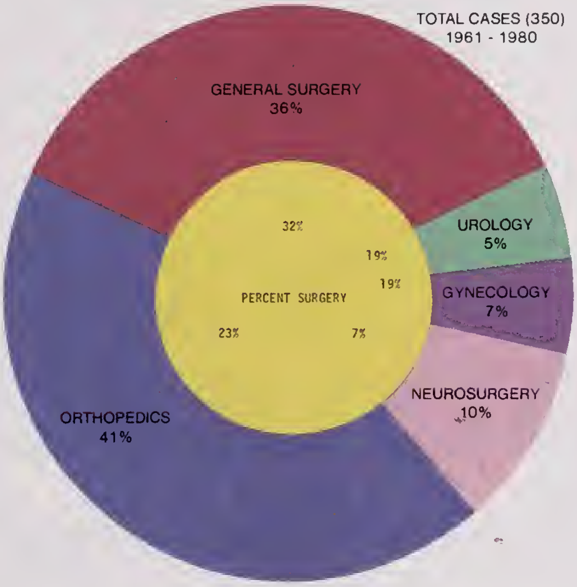

Figure 7 - Frequency of diagnoses associated with pulmonary embolism.

Deep venous thrombosis, the antecedent cause of pulmonary embolism, was observed clinically and diagnosed in less than half of the cases of pulmonary embolism. The angiogram remains the standard in the diagnosis of deep venous thrombosis with extremity plethysmography the next most utilized.

Summary

The cases of pulmonary embolism observed on the surgical services at Duluth's St. Luke's and St. Mary's hospitals between 1961 and 1980 were reviewed. There was an increase in the sophistication of diagnosis and treatment transpiring with an early multidisciplinary approach to the prophylaxis of pulmonary embolism targeted to the "predisposed" patient. The result is a decrease in pulmonary embolism to the lowest frequency of 2 to 4 cases monthly.

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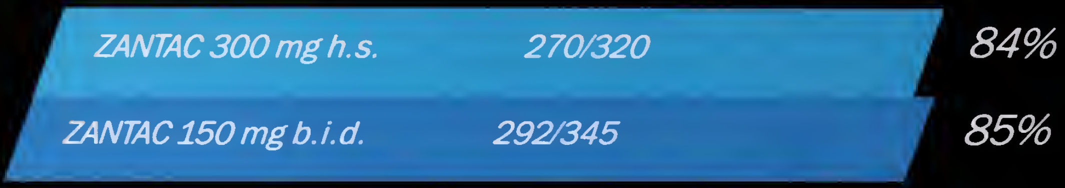
Heals active duodenal ulcers after 4 weeks in most patients*[1]



In well-controlled, double-blind, multicenter trials, ZANTAC 300 mg h.s. healed active duodenal ulcers in 84% of patients after 4 weeks. After 8 weeks, healing rates may be higher with ZANTAC 150 mg b.i.d. (92%) than with ZANTAC 300 mg h.s. (87%).

Relieves pain and other symptoms as effectively as ZANTAC 150 mg b.i.d.[1]

Zantac® 300

ranitidine HCl/Glaxo 300 mg tablets

Once-daily dosing may enhance compliance in patients for whom dosing convenience is important

Side-effects profile comparable to ZANTAC 150 mg b.i.d.[1-3]

Headache—sometimes severe—has been reported. Rare effects on the CNS, cardiovascular, GI, hepatic, and integumental systems have been observed, as well as rare cases of hypersensitivity reactions. See ADVERSE REACTIONS section of Brief Summary of Product Information before prescribing.

No significant interference with the hepatic cytochrome P-450 enzyme system at recommended doses

ZANTAC 300 mg h.s. had no significant drug interactions with theophylline or warfarin. The bioavailability of certain medications whose absorption is dependent on a low gastric pH may be altered when ZANTAC or other medications which decrease gastric acidity are administered.

Glaxo/ROCHE

See next page for references and Brief Summary of Product Information.

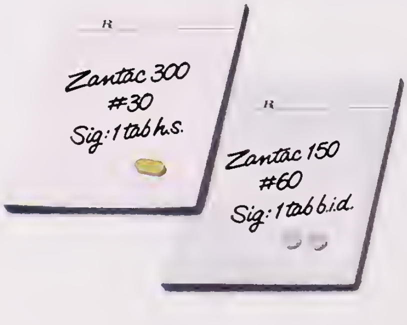
**It is not known exactly how much acid inhibition is needed to heal ulcers.*

IN ACTIVE DUODENAL ULCERS

Once-a-night h.s. therapy controls acid rain

Zantac® 300
ranitidine HCl/Glaxo 300 mg tablets

Now...two effective regimens to treat active duodenal ulcers



References: 1. Data available on request, Glaxo Inc. **2.** Ireland A, Colin-Jones DG, Gear P, et al: Ranitidine 150 mg twice daily vs 300 mg nightly in treatment of duodenal ulcers. *Lancet* 1984;2:274-275. **3.** Colin-Jones DG, Ireland A, Gear P, et al: Reducing overnight secretion of acid to heal duodenal ulcers. *Am J Med* 1984, 77 (suppl 5B):116-122.

ZANTAC® 150 Tablets
(ranitidine hydrochloride)
ZANTAC® 300 Tablets
(ranitidine hydrochloride)

BRIEF SUMMARY OF PRODUCT INFORMATION

INDICATIONS AND USAGE: ZANTAC® is indicated in:
1. Short-term treatment of active duodenal ulcer. Most patients heal within four weeks. Studies available to date have not assessed the safety of ranitidine in uncomplicated duodenal ulcer for periods of more than eight weeks.
2. Maintenance therapy for duodenal ulcer patients at reduced dosage after healing of acute ulcers. No placebo-controlled comparative studies have been carried out for periods of longer than one year.
3. The treatment of pathological hypersecretory conditions (eg, Zollinger-Ellison syndrome and systemic mastocytosis).
4. Short-term treatment of active, benign gastric ulcer. Most patients heal within six weeks and the usefulness of further treatment has not been demonstrated. Studies available to date have not assessed the safety of ranitidine in uncomplicated, benign gastric ulcer for periods of more than six weeks.
5. Treatment of gastroesophageal reflux disease. Symptomatic relief commonly occurs within one or two weeks after starting therapy. Therapy for longer than six weeks has not been studied.

In active duodenal ulcer; active, benign gastric ulcer; hypersecretory states; and GERD, concomitant antacids should be given as needed for relief of pain.

CONTRAINDICATIONS: ZANTAC® is contraindicated for patients known to have hypersensitivity to the drug.

PRECAUTIONS: General: 1. Symptomatic response to ZANTAC® therapy does not preclude the presence of gastric malignancy.
2. Since ZANTAC is excreted primarily by the kidney, dosage should be adjusted in patients with impaired renal function (see **DOSAGE AND ADMINISTRATION**). Caution should be observed in patients with hepatic dysfunction since ZANTAC is metabolized in the liver.

Laboratory Tests: False-positive tests for urine protein with Multistix® may occur during ZANTAC therapy, and therefore testing with sulfosalicylic acid is recommended.

Drug Interactions: Although ZANTAC has been reported to bind weakly to cytochrome P-450 in vitro, recommended doses of the drug do not inhibit the action of the cytochrome P-450-linked oxygenase enzymes in the liver. However, there have been isolated reports of drug interactions which suggest that ZANTAC may affect the bioavailability of certain drugs by some mechanism as yet unidentified (eg, a pH-dependent effect on absorption or a change in volume of distribution).

Carcinogenesis, Mutagenesis, Impairment of Fertility: There was no indication of tumorigenic or carcinogenic effects in lifespan studies in mice and rats at doses up to 2,000 mg/kg/day.

Ranitidine was not mutagenic in standard bacterial tests (*Salmonella, E coli*) for mutagenicity at concentrations up to the maximum recommended for these assays.

In a dominant lethal assay, a single oral dose of 1,000 mg/kg to male rats was without effect on the outcome of two matings per week for the next nine weeks.

Pregnancy: ***Teratogenic Effects: Pregnancy Category B:*** Reproduction studies have been performed in rats and rabbits at doses up to 160 times the human dose and have revealed no evidence of impaired fertility or harm to the fetus due to ZANTAC. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers: ZANTAC is secreted in human milk. Caution should be exercised when ZANTAC is administered to a nursing mother.

Pediatric Use: Safety and effectiveness in children have not been established.

Use in Elderly Patients: Ulcer healing rates in elderly patients (65 to 82 years of age) were no different from those in younger age groups. The incidence rates for adverse events and laboratory abnormalities were also not different from those seen in other age groups.

ADVERSE REACTIONS: The following have been reported as events in clinical trials or in the routine management of patients treated with oral ZANTAC®. The relationship to ZANTAC therapy has been unclear in many cases. Headache, sometimes severe, seems to be related to ZANTAC administration.

Central Nervous System: Rarely, malaise, dizziness, somnolence, insomnia, and vertigo. Rare cases of reversible mental confusion, agitation, depression, and hallucinations have been reported, predominantly in severely ill elderly patients.

Cardiovascular: Rare reports of tachycardia, bradycardia, and premature ventricular beats.

Gastrointestinal: Constipation, diarrhea, nausea/vomiting, and abdominal discomfort/pain.

Hepatic: In normal volunteers, SGPT values were increased to at least twice the pretreatment levels in 6 of 12 subjects receiving 100 mg qid IV for seven days, and in 4 of 24 subjects receiving 50 mg qid IV for five days. With oral administration there have been occasional reports of reversible hepatitis, hepatocellular or hepatocanalicular or mixed, with or without jaundice.

Musculoskeletal: Rare reports of arthralgias.

Hematologic: Rare reports of reversible leukopenia, granulocytopenia, thrombocytopenia, and pancytopenia.

Endocrine: Controlled studies in animals and man have shown no stimulation of any pituitary hormone by ZANTAC and no antiandrogenic activity, and cimetidine-induced gynecomastia and impotence in hypersecretory patients have resolved when ZANTAC has been substituted. However, occasional cases of gynecomastia, impotence, and loss of libido have been reported in male patients receiving ZANTAC, but the incidence did not differ from that in the general population.

Integumental: Rash, including rare cases suggestive of mild erythema multiforme, and, rarely, alopecia.

Other: Rare cases of hypersensitivity reactions (eg, bronchospasm, fever, rash, eosinophilia) and small increases in serum creatinine.

OVERDOSAGE: There is no experience to date with deliberate overdosage. The usual measures to remove unabsorbed material from the gastrointestinal tract, clinical monitoring, and supportive therapy should be employed.

Studies in dogs receiving doses of ZANTAC® in excess of 225 mg/kg/day have shown muscular tremors, vomiting, and rapid respiration. Single oral doses of 1,000 mg/kg in mice and rats were not lethal. Intravenous LD_{50} values in rat and mouse were 83 and 77 mg/kg, respectively.

DOSAGE AND ADMINISTRATION: Dosage Adjustment for Patients with Impaired Renal Function: On the basis of experience with a group of subjects with severely impaired renal function treated with ZANTAC®, the recommended dosage in patients with a creatinine clearance less than 50 ml/min is 150 mg every 24 hours. Should the patient's condition require, the frequency of dosing may be increased to every 12 hours or even further with caution. Hemodialysis reduces the level of circulating ranitidine. Ideally, the dosage schedule should be adjusted so that the timing of a scheduled dose coincides with the end of hemodialysis.

HOW SUPPLIED: ZANTAC® 150 Tablets (ranitidine hydrochloride equivalent to 150 mg of ranitidine) are white tablets embossed with "ZANTAC 150" on one side and "Glaxo" on the other. They are available in bottles of 60 tablets (NDC 0173-0344-42) and unit dose packs of 100 tablets (NDC 0173-0344-47).

ZANTAC® 300 Tablets (ranitidine hydrochloride equivalent to 300 mg of ranitidine) are yellow, capsule-shaped tablets embossed with "ZANTAC 300" on one side and "Glaxo" on the other. They are available in bottles of 30 (NDC 0173-0393-40) and unit dose packs of 100 tablets (NDC 0173-0393-47).

Store between 15° and 30°C (59° and 86°F) in a dry place. Protect from light. Replace cap securely after each opening.

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Diabetic Nephropathy: An Hypothesis Regarding Genetic Susceptibility for the Disorder

ELIZABETH R. SEAQUIST, M.D.*, FREDERICK C. GOETZ, M.D.*, and SUE POVEY, M.D., D. Phil. +

Diabetic nephropathy develops after years of disease in only about 50% of diabetics. We hypothesize that susceptible persons have inherited a metabolic limitation that becomes evident only in a diabetic internal environment. This limitation probably involves the metabolism of the glomerulus or mesangium. Family studies and twin studies, both clinical and biochemical, are suggested to test our hypothesis.

Diabetic nephropathy is manifested only after many years of survival with diabetes. An uncommon complication in the pre-insulin era, it has become a common cause of death in diabetics in contemporary times. While great strides have been made in improving the therapies offered patients with nephropathy, much uncertainty remains in our understanding of the pathogenesis of this diabetic complication.

Susceptibility to Diabetic Nephropathy: Host Factors

Examination of information obtained on the natural course of diabetes suggests patients may fall into two groups based on their susceptibility to nephropathy. One group of patients seems to be at great risk to develop the clinical syndrome of proteinuria, hypertension, and progressive renal failure. The other group seems to be spared these complications, even after 30 or more years of disease.

This idea was suggested more than two decades ago by data presented by White on the long-term follow up of juvenile-onset diabetes.[1] In her report, the prevalence of albuminuria increased steadily with the duration of diabetes up to 25 years of disease. In longer-duration patients, prevalence increased very little. At 35 years the frequency was 44%; that is, 56% of these diabetics failed to exhibit albuminuria. Thus, it seems that one group of diabetics was susceptible to diabetic nephropathy, while another set was not.

Other studies have confirmed these findings. In Copenhagen, observations on the clinical course of over 1,000 Type I diabetics reveal 57% of these patients did not develop proteinuria after more than 25 years of follow-up.[2] Knowles[3] found the cumulative risk of proteinuria to increase linearly with duration of diabetes up to 30 years. After that time, the risk remained unchanged; 53% of his patients remained free of nephropathy after 30 years of disease, even though intensive metabolic control was not attempted. Although there has been an impression that maturity-onset, non-insulin dependent (Type II) diabetic patients have a low risk of nephropathy, this may be the result of considerable underestimation of its incidence. Recent studies[4,5] indicate that the risk for Type II diabetics may approach 50% or more—about the same as that for Type I subjects.

Additional support from a somewhat different epidemiologic perspective comes from Moloney et al. in their investigation of all diabetics dying in the United Kingdom at less than 50 years of age.[6] They compared the number of actual deaths from nephropathy to the number of expected deaths using the assumption that the deaths from renal disease would be equally distributed by duration of diabetes. They found significantly more actual uremic deaths than expected in patients with less than 30 years of diabetes and significantly fewer uremic deaths than expected in patients with more than 30 years of diabetes. Moloney et al. believe this indicates some diabetics are prone to, while others are protected from nephropathy. Those prone to this complication appear to manifest it clinically before 30 years of diabetes.

These five reports, from four countries, fit the concept that half of all diabetics are susceptible to diabetic kidney disease and half are not. The consistency in the degree of susceptibility risk for nephropathy across decades of observations of more than 1,500 patients suggests common and invariable factors are responsible. While persistent hyperglycemia appears to increase the risk of developing albuminuria,[7] good control does not appear to eliminate this risk entirely.[8] Although crucial long-term studies have yet to be reported, the implication of available reports is very strong that, at a given

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level of metabolic control, expression of nephropathy varies markedly. Likewise, hypertension is associated with elevated urinary albumin excretion,[9] but normotension does not eliminate the risk for albuminuria.[7] While common environmental factors cannot be ruled out as important in determining nephropathy risk, we propose that genetic susceptibility may be the most important determinant. If diabetics merely represent a subset of the general population, perhaps half of the general population would develop nephropathy if exposed to a diabetic state.

Biochemical Alterations in Diabetic Nephropathy

Pathologic studies of diabetic nephropathy have found the glomerular basement membrane to thicken progressively as the period of exposure to the diabetic environment increases.[10] Biochemical analysis has also shown the kidney with nephropathy to contain increased amounts of glomerular basement membrane and mesangium when compared to controls.[11] These findings indicate diabetic nephropathy involves an increase in the synthetic rate of the glomerular basement membrane or mesangium (GBM-M), a decrease in degradation, or both.

Evidence supporting a role for an elevated synthetic rate of GBM-M comes from the finding of an increase in the membrane content of hydroxylysine and hydroxylysine-linked glucosylgalactose units in kidneys of diabetic humans.[11] Elevations in the activities of lysyl hydroxylase[12] and glucosyl transferase[13] have also been reported in diabetic animals.

The possibility that decreased degradation of GBM-M is responsible for diabetic nephropathy was supported by the discovery of lower levels of lysosomal glycosidases in kidneys of streptozotocin-treated diabetic rats.[14] Similar observations were made in the spontaneously diabetic Chinese hamster, where a decrease in alpha- and beta-galactosidase activities was observed after the development of hyperglycemia.[15] Chang and Greenberg[16] found significant variation to occur in the activities of beta-galactosidase, alpha-galactosidase, and N-acetyl-beta-D-N-hexosaminidase among the diabetic lines of Chinese hamsters. They speculate that lines capable of exhibiting lower glycohydrolase levels in the diabetic state would be more susceptible to nephropathy. Indeed, Soret, Chang, and others reported that glomerular basement membrane thickening was less in the AC line of diabetic Chinese hamsters, a line that has galactosidase levels comparable to age-matched nondiabetic controls.[17] Their enzymes may be resistant to the diabetic effect.

Hypothesis

From the preceding discussion it is clear that diabetics vary in susceptibility to nephropathy. This variability appears to be independent of environmental factors like glycemic or blood pressure control. Therefore, as in infectious disease where factors intrinsic to the host largely determine the response to the infecting organism, individuals may have intrinsic differences in their biochemical constitution that determine the response of their kidneys to years of exposure to diabetes. Differences in susceptibility to nephropathy may represent biochemical differences that are based in heredity. The hypothesis may be formulated as follows: *There is generally distributed in the world's population a gene (or gene group) determining susceptibility to diabetic nephropathy.* At present, the susceptible state can be recognized only after prolonged exposure of the individual to diabetes. The gene must be widely distributed, since about half of those exposed to diabetes develop clinical nephropathy.

The biochemical abnormality encoded by the "susceptibility gene" may involve the metabolism of the GBM-M. Individuals at risk to develop renal complications may demonstrate increased activity of synthetic enzymes in the presence of diabetes. Alternatively, there might be decreased removal of basement membrane or mesangium in the diabetic state. Such patients may be comparable to the XA line of Chinese hamsters which demonstrate a decrease in kidney glycosidases only after hyperglycemia has developed.[15] Whatever the abnormality encoded by the susceptibility gene might be, it must, over time, lead to the functional changes that are seen in diabetic nephropathy. In the absence of sufficient exposure to diabetes, kidney function might remain normal. Diabetics who remain free of nephropathy after years of disease must have a metabolism that can tolerate the stress of the diabetic state. We propose that the postulated gene determining susceptibility to nephropathy is biochemically quite distinct from the gene(s) determining susceptibility to diabetes—which may reside on Chromosome VI (Type I diabetes), Chromosome XI (Type II diabetes), or elsewhere. (Note is made of the possibility that in a particular form of heritable diabetes the susceptibility gene and the diabetic gene might be close neighbors on the same chromosome—i.e., linked.)

The susceptibility might reside in a relatively subtle single-base mutation in DNA coding for a macromolecule, such as has been demonstrated for genes for collagen synthesis.[18]

Analogous situations may be found in other disorders in which a specific inherited biochemical defect produces symptoms only in the presence of a specific environmental challenge—for example, excessive susceptibility to certain drugs such as succinyl choline. Affected individuals have impaired drug metabolism because of the presence of an atypical pseudocholinesterase. This metabolic defect is not clinically evident unless such a person is challenged with succinyl choline,[19] when the results may be disastrous.

There is another rather parallel situation in alpha-1-antitrypsin deficiency, where among individuals homozygous for the abnormal PiZ protein phenotype, the majority will contact chronic obstructive lung disease, yet some escape clinical troubles past age 60; also, 14% will develop severe liver disease very early in life, but most will not.[20] These findings have led to the suggestion that susceptibility to lung or liver disease in the ZZ patients may depend on genetic variation at a second (or third?) locus.[21]

Studies to Test This Hypothesis

If the metabolic defect hypothesized to exist in nephropathy-prone diabetics is real, it must represent the phenotypic expression of a genotype common to this population. Therefore, family studies within this group would be useful to test the hypothesis. One would expect to find a greater incidence of nephropathy in diabetic relatives of nephropathic patients when compared to the diabetic relatives of non-nephropathic diabetics.

There is a problem here, however. Since about 50% of diabetics develop nephropathy, the postulated susceptibility gene must be very common. Whether dominant or recessive, the same gene would be shared by a diabetic nephropathy propositus and a first degree relative about half the time—about the same as the expectation in a random member of the population. This would make it more difficult to demonstrate a "family effect" in nephropathic as opposed to non-nephropathic diabetes. To support the existence of a separate "nephropathy" genetic factor (as opposed to environmental effects, or nephropathy associated with certain specific genes for diabetes itself), study of a large number of diabetic families using sensitive and specific indicators of nephropathy will be necessary.

Even better (the inevitable suggestion, perhaps) would be a study of twins concordant for diabetes, both identical and non-identical, to examine concordance for nephropathy. Identical twin studies would provide the most valuable information.

One of the appealing aspects of our proposal is the reconciliation it offers for two widely held and presumably incompatible views of the origin of diabetic small-vessel disease; one, that the damage is determined by a genetic defect having nothing to do with hyperglycemia,[22] the other that it is caused directly by hyperglycemia (or, at least, by the diabetic state).[23] Both views may be correct, we believe.

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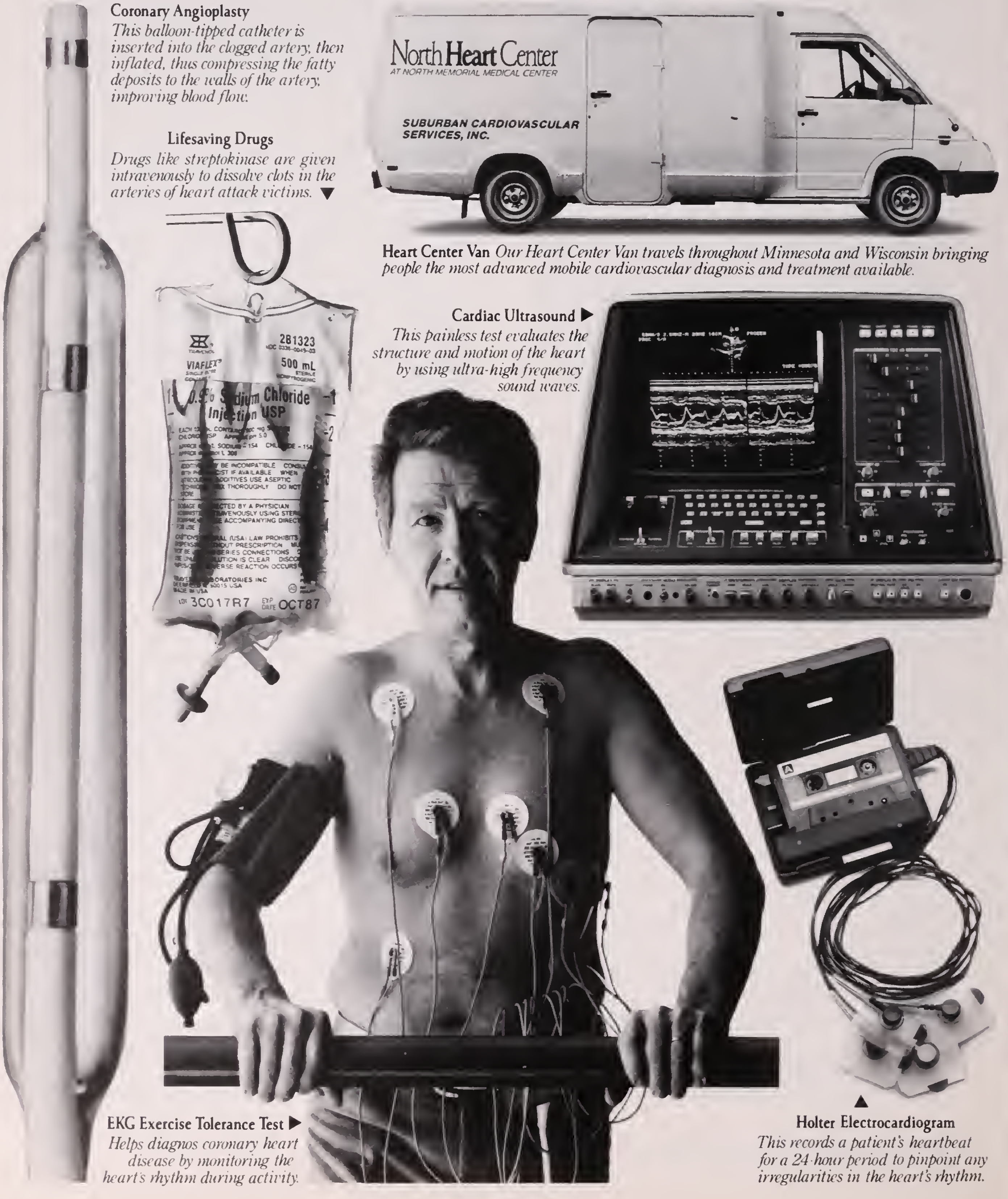
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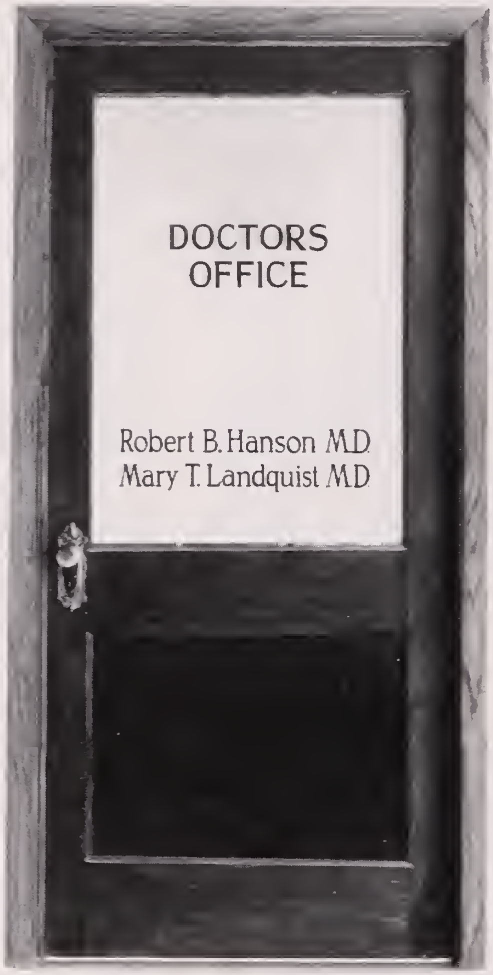

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Cystic Lymphangioma Presenting as Subacute Thyroiditis

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J. WILLIAM CHARBONEAU, M.D.§

An adult patient had a cystic lymphangioma that imitated subacute (granulomatous) thyroiditis. The acute pain and swelling were probably due to spontaneous hemorrhage into the lymphangioma. Differentiating intrathyroidal from extrathyroidal lesions can be difficult clinically; high-resolution ultrasonography may be helpful.

Cystic lymphangiomas (cystic hygromas) are uncommon congenital abnormalities of the lymphatic system, usually presenting at birth as masses in the neck, axilla, or mediastinum. In most reported series, less than 10% of cystic lymphangiomas occur in adults, and generally, the lesions are painless, persistent cervical masses.[1] We describe a patient who had recurrent severe neck pain associated with swelling in the region of the thyroid due to hemorrhage into and inflammation of a cystic lymphangioma.

Report of a Case

A 28-year-old woman was referred to the thyroid clinic in August 1982 because of the sudden onset of swelling and pain in the left anterior aspect of her neck. The patient had experienced three similar episodes during the preceding three months. The episodes typically evolved in minutes and were characterized by severe pain, pronounced tenderness, and localized swelling. The pain and tenderness usually subsided within hours after onset, but the swelling gradually decreased during the subsequent one to two days. The current episode was more painful and prolonged than usual, prompting the patient to seek medical attention.

On examination, the patient was afebrile and had none of the signs of thyrotoxicosis. A visible area of swelling in the left lobe of the thyroid was extremely tender but without increased warmth. The right lobe of the thyroid was normal. There was no local adenopathy. Serum thyroxine level, erythrocyte sedimentation rate, and a 24-hour thyroidal radioiodine uptake were ordered to evaluate the possibility of subacute thyroiditis. The patient was instructed to take acetaminophen for relief of pain and to return in two days. When she returned, the swelling had decreased, as had the tenderness. Results of all of the aforementioned tests were normal.

In October 1982, the patient experienced an identical episode of cervical pain and swelling and returned to the thyroid clinic. The examination was similar to that of the previous visit. High-resolution (10 MHz) real-time ultrasonography demonstrated a 5.0 x 2.5 x 2.5 cm mass posterior to the mid and upper portions of the left lobe of the thyroid. This mass was predominantly cystic, with septations and solid components, and displaced the thyroid anteriorly (Figure 1). The differential diagnosis included unusual branchial cleft cyst, abscess, and unusual duplication cyst.

Because of the frequent recurrence and idiopathic nature of the patient's painful neck lesion, operation was advised. Results of routine preopera-

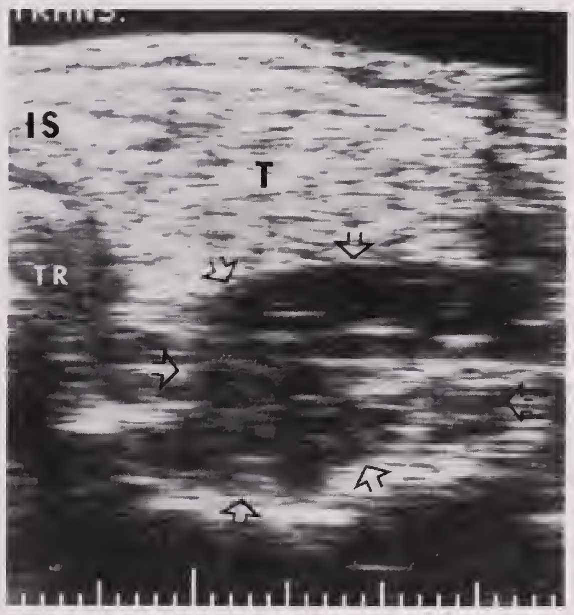

Figure 1 - High-resolution transverse sonogram of left side of neck demonstrates cystic mass (arrows) posterior to left lobe of thyroid (T). IS isthmus of thyroid; TR tracheal gas shadow.

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tive tests (complete blood count with differential count, chemistry group, sedimentation rate, urinalysis, chest roentgenogram, and electrocardiogram) were all normal.

Elective cervical exploration was performed, with the preoperative diagnosis of a possible branchial cleft cyst. Through a left-sided transverse incision, the left lobe of the thyroid gland was exposed. The gland was normal, but its upper pole was displaced anteriorly by an edematous mass (5.0 x 2.5 cm) attached to the posterior aspect of the superior pole of the thyroid. No obvious arterial or venous supply was noted. The mass was totally excised after mobilization and division of the upper pole of the thyroid. There was no tracheal connection suggesting fistulization. Grossly, the specimen was cystic with dark blood and fluid in the lumen. Microscopic study revealed a classic cystic lymphangioma with evidence of subacute inflammation. The postoperative course was uneventful, and four months later, the patient had experienced no further episodes of either pain or swelling.

Discussion

This patient had several uncommon aspects of a rare condition. In a review of the literature, Nussbaum and Buchwald[2] found only 63 cases of adult cystic lymphangioma. Most of the patients had a painless mass as the only complaint. The simulation of thyroid disease in our patient appears to be distinctly unusual.

Lymphangiomas are believed to result from sequestration of primitive lymphatic channels in the embryo. They have been classified into three groups: (1) lymphangioma simplex, composed of capillary-sized thin-walled lymphatic channels; (2) cavernous lymphangioma, composed of dilated lymphatic channels, often with fibrous adventitial coats; and (3) cystic lymphangioma (cystic hygroma), composed of cysts ranging in diameter from a few millimeters to several centimeters. All three types have occasionally been found in the same lesion. The most common locations for cystic lymphangiomas are the neck, axilla, and thorax, although they have been found in many other sites, including the extremities, abdomen, colon, kidneys, mesentery, adrenal glands, and spleen. The size of these masses may vary greatly from patient to patient, and the masses may slowly enlarge or shrink. Cystic lymphangiomas are seldom painful unless infected. The fluid in the cysts is clear or straw-colored, accounting for their ability to be transilluminated.

A preoperative diagnosis of a cystic lymphangioma is uncommonly made because of the rarity of this condition in adults. Branchial cleft cyst is the most frequent preoperative diagnosis, but other considerations should include thyroglossal duct cyst, lipoma, dermoid cyst, and hemangioma.[3] In this particular situation, hemorrhage into a thyroid nodule was considered since differentiation of the mass from adjacent thyroid gland was not possible clinically. The ultrasonographic appearance of cystic lymphangioma reflects the gross morphology. Because these masses are composed of innumerable cystic spaces, the mass will appear predominantly fluid-filled with multiple septations between the spaces. Cyst aspiration has been done, but this is somewhat risky because of the danger of infection.

The origin of hemorrhage into this cystic lymphangioma is not clear. It has been demonstrated that the lymphatic and vascular systems are of common embryologic origin[4] and that, under circumstances of increased pressure in the venous system[5] or after removal of fluid from cystic lymphangiomas,[6] blood may appear in the lymph. This is presumably due to lymphatico-venous anastomoses, which under normal circumstances are not patent. Since neither of these conditions was present in this patient, it is more likely that the arterial or venous supply to the cystic lymphangioma was fragile and easily disrupted, leading to hemorrhage into the structure.

Surgical excision is the treatment of choice for a cystic lymphangioma. In adults, this is generally not difficult. In some children and a few adults, the lymphatic component retains its embryonic ability to infiltrate tissues in abortive attempts to establish lymphatic channels, creating an infiltrative process that may be extremely difficult to remove entirely. Because of this, characteristic lymphangiomas were at one time considered to be malignant. There has been one report of an infant who required amputation of an upper extremity because of massive infiltration of a lymphangioma.[1] Radiation therapy is sometimes used for patients who do not respond well to operation and may be helpful in selected cases.

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Before prescribing, see complete prescribing information in SK&F CO. literature or *PDR*. The following is a brief summary.

* **WARNING**

This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired**. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy**. Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of triamterene and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Angiotensin-converting enzyme (ACE) inhibitors can elevate serum potassium; use with caution with 'Dyazide'. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function. Thiazides may add to or potentiate the action of other antihypertensive drugs. Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

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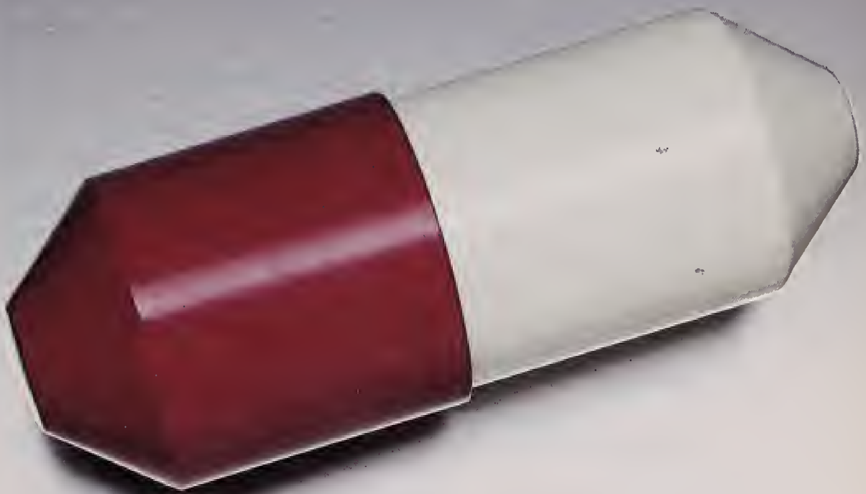

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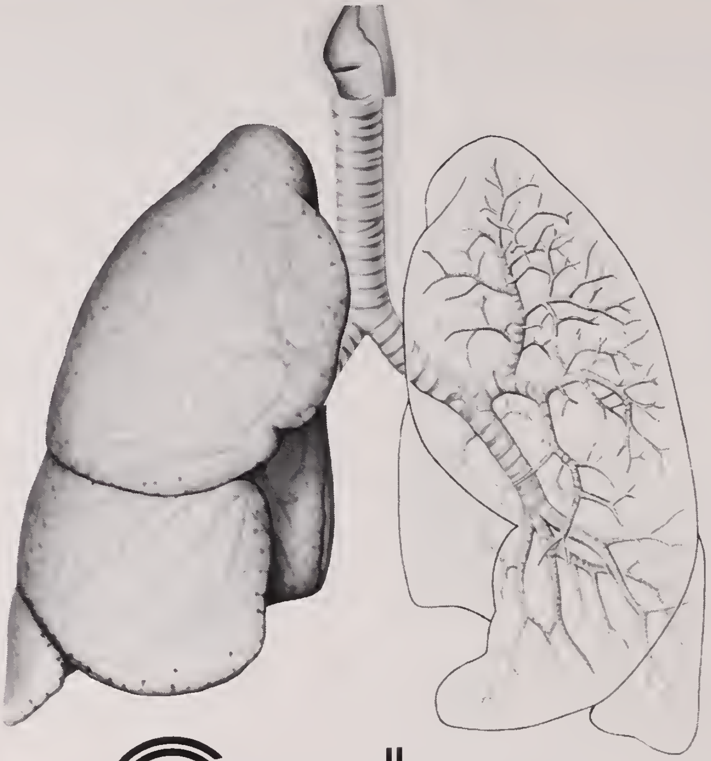

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- Positive direct Coombs' tests have been reported during treatment with cephalosporins.
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- Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.
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Human Immunodeficiency Virus in Minnesota:

Statewide Risk Reduction and Disease Prevention Plan

Summarized by KRISTINE L. MACDONALD, M.D.,* and prepared by the COMMISSIONER'S TASK FORCE ON AIDS†

Between 1980 and June of 1985, 37 cases of AIDS were reported to the Minnesota Department of Health (MDH). In the next 12 months, that number jumped to 100, and the MDH predicts that Minnesota case numbers will be between 1,000 and 2,000 by the end of 1990 if risk reduction programs are not implemented immediately. This report briefly outlines the Statewide Risk Reduction and Disease Prevention Plan as developed by the Commissioner's Task Force on AIDS and recently approved by the Commissioner of Health. The Acute Disease Epidemiology Section of the MDH is currently implementing the plan.

Objectives

The major objectives of the plan are outlined in Table 1. The first objective is to study the prevalence and incidence of infection with human immunodeficiency virus (HIV) in Minnesota. This objective is critical to determine the magnitude of the epidemic and to follow the success of risk reduction strategies. Disease surveillance through reporting to the MDH can help evaluate trends in prevalence of infection. AIDS became a legally reportable disease in Minnesota in June 1985. In October 1985 a positive HIV antibody test result was interpreted by the Commissioner of Health to indicate HIV infection and, therefore, also was determined to be a reportable condition. Interviews with persons who have AIDS or are reported to be HIV antibody positive can allow ongoing assessment of risk factors and evaluation of disease trends. Because the incubation period of the disease is long (up to at least seven years), reportability of HIV antibody positive persons can allow a much more accurate assessment of current disease trends than can interviews of only AIDS patients, who likely acquired infection several years earlier.

A second way to evaluate prevalence of infection is to conduct seroprevalence surveys among persons in high-risk groups. The MDH conducted one such seroprevalence survey among gay and bisexual men in the fall of 1985 and intends to conduct similar surveys among gay and bisexual men and other high-risk groups in the future. For high-risk persons, rates of seropositivity can also be followed on an ongoing basis by evaluating data obtained at the state-sponsored counseling and testing sites (formerly termed the alternate test sites). However, because this group is self-selected, limited inferences can be made from these data. In addition to evaluating seroprevalence rates among persons in high-risk groups, it is also important to evaluate trends in low-risk groups. This can be done in several ways. First, seroprevalence rates can be determined for potential blood donors. Follow-up interviews of any potential donors determined to be HIV antibody positive can provide data on known risk factors for this group. In addition, seroprevalence data can be collected from persons attending sexually transmitted disease clinics. These data can be correlated with number of sexual partners and types of sexual activity to provide information on trends of infection among heterosexuals.

TABLE 1

Objectives of the Statewide Risk Reduction and Disease Prevention Center Plan, Minnesota 1986

1. To study the prevalence and incidence of HIV infection in Minnesota.
2. To study and evaluate knowledge, attitudes, and behavior of gay and bisexual men and intravenous drug abusers as related to HIV infection.
3. To develop outreach programs.
4. To conduct programs leading to risk reduction through behavioral change.
5. To provide public education.
6. To provide professional education.
7. To develop programs for dealing with situations that pose particular problems.
8. To evaluate the efficacy of all risk reduction programs.

The second objective is to study and evaluate knowledge, attitudes, and behaviors about HIV infection among gay and bisexual men and intravenous drug abusers. Obtaining such data can aid in the allocation of resources for education aimed at behavioral change. Surveys of persons attending counseling and testing sites; participating in seroprevalence studies; and participating in specific educational programs, such as drug treatment, can all be used to evaluate baseline levels of knowledge and behavior and to evaluate effectiveness of specific risk reduction programs.

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The third objective is to develop outreach programs to identify persons at high risk. Potential outreach efforts include media campaigns to specific high-risk populations. Additional efforts need to be targeted to the general population because Minnesota has a large community of persons who are at high risk but who are not part of organized activities for any specific risk group. A second method of outreach is contact notification or voluntary partner referral. By encouraging the notification of contacts and voluntary partner referral of HIV antibody positive persons, those who are at highest risk can be identified and counseled on a one-to-one basis about ways they can reduce their own risk of acquiring infection or the risk of transmitting the virus to others.

The fourth objective is to conduct programs leading to risk reduction through behavioral change; this can be accomplished in several ways. First, one-to-one counseling is currently provided at the state's five counseling and testing sites. It is particularly important that high-risk persons learn of their antibody status, which may encourage them to make behavioral change. In addition, persons in high-risk groups who visit the testing sites need to be assured that their confidentiality will be protected. Currently, this is best provided by maintaining a "name neutral" policy at the testing sites. This means that if a person at a test site is HIV antibody positive, that person will be asked for his or her name and will be told the implications of giving that information; however, appropriate services will not be denied by any local or state agency whether or not a name is provided. A second way to accomplish behavioral change is through group education programs. These programs need to be aimed at persons at high risk and must teach them how to make and sustain behavioral changes necessary to limit transmission of HIV. The MDH can promote such programs by providing funding to community-based organizations.

The fifth objective is to provide public education to curb the hysteria associated with the AIDS epidemic. This can be accomplished through specific media coverage, public lectures and seminars, school-based education, education in the workplace, and the AIDS hotline. The hotline, available to the general public and to high-risk persons, provides general information about HIV infection.

The sixth objective is to provide professional education. This can be achieved through the MDH newsletter and through professional education seminars.

The seventh objective is to develop programs for dealing with situations that pose particular problems. Those situations include HIV infections among persons with mental handicaps and persons who are mentally ill. Dealing with noncompliant patients also poses a unique problem. The MDH, the Commissioner's AIDS Task Force, and local public and private agencies need to develop strategies and policies for managing these problems.

Finally, the last objective is to evaluate the efficacy of risk reduction programs. Such studies need to be designed and implemented. Efficacy should be quantitated by behavior change and rates of HIV antibody seroprevalence among specific high-risk groups.

Summary

The above overview of the risk reduction and disease prevention plan for the state of Minnesota is multifaceted and aimed at maximizing the benefits that can be achieved through a variety of approaches. Any single approach by itself will not be effective. Media campaigns and contact notification programs are outreach methods that allow access to persons at high risk. Through such outreach programs high-risk persons can be identified and encouraged to participate in counseling and education programs aimed at behavioral change. In addition, media campaigns aimed at the general public as well as education programs aimed at the public, the schools, the worksite, and health care providers can increase knowledge and understanding of the disease to curb AIDS hysteria. Finally, methods to monitor the course of the epidemic in Minnesota and methods to evaluate effectiveness of various risk reduction programs must be incorporated into any disease prevention plan.

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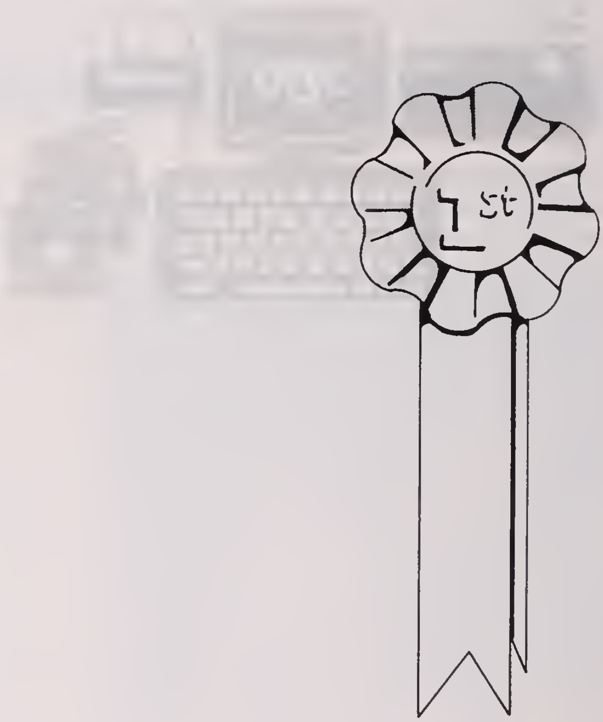

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Reese Award Acceptance Speech

AKE FLOCK, M.D., Ph.D.

The Reese award is presented each year by the International Hearing Foundation (IHF) through the generosity of Sheldon Reese, a philanthropist from Mitchell, South Dakota who has an interest in hearing research, to an individual who has made a major contribution in the past ten years in the hearing sciences. This contribution may include studies in the prevention or amelioration of deafness in the basic and clinical sciences as well as engineering. The award includes $30,000 and a gold medal. This year's award winner is Ake Flock, who is professor and chairperson of the Department of Physiology at the Karolinska Institute in Stockholm, Sweden.

I would like to comment on research and the process of solving a problem.

Many times in life and in our professions, we are faced with a problem, say a failing car or a patient with a disease. The problem is there, and it comes to you.

In research work we also deal with the solving of problems, but the great difference is that we are not faced with the problem, we are ourselves responsible for creating it by having an idea upon which we base our research projects.

Therefore, the fundamental thing in science is to have a question and ideas around which to build our problem-solving activities. Often enough, you do not know in advance whether the question is a good one. This will be shown only when you have the results.

This means that when you have developed (with much effort) an experimental technique to study a certain phenomenon, the result may prove to be uninteresting, and the whole project may have to be terminated. Even worse, you may not even get any results because the problem was too difficult.

Therefore, we often have several pilot projects running in parallel in order to test various approaches. Sometimes, it is the unexpected result, the unplanned experiment, or the haphazard observation that gives the most important hints about how to continue.

One of the most important aspects of research is that the researcher has to be free—free to fail and free to test that which does not guarantee result. Research should not be locked by promises to produce a certain result already guaranteed by preliminary experiments.

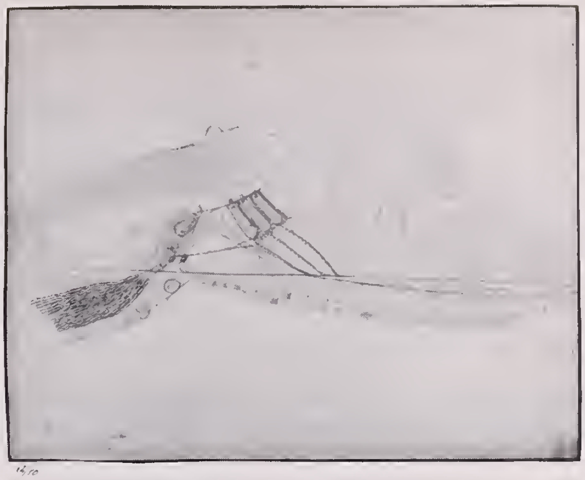

Figure 1 - Reproduction of original drawing by Gustaf Retzius of the organ of Corti for his 1883 volume on the inner ear.

Also important is time—time to develop methods that may not produce anything that is seen from the outside until several years later.

Of further importance is collaboration. By this, I mean collaboration in two ways: Collaboration between methods—the fusion of methods from different disciplines to illuminate a common question. And second, collaboration between persons in the form of teamwork, within a department and together with guest researchers, often on an international basis.

Another important factor in research is tradition—the fact that our work today is built on a pyramid of work performed by earlier researchers. A good example of tradition within the field of hearing is the persistence of the fundamental work of Gustaf Retzius, who was a histologist working at the Karolinska Institute and who made the famous volumes on the structure of the organs of hearing. This work was published 100 years ago and still has vitality.

Retzius was a master of synthesizing what he saw in the microscope by making very artistic drawings. We have managed to locate the original drawings for these volumes, and some of these have been reproduced as facsimile prints. I have such a print of the drawing that I think best fits today's occasion. It is a drawing of the organ of Corti (Figure 1).

As an expression of my respect for all those who have done inner ear research before me and with me, and as a token of gratitude to those who support research, I would like to give this old drawing to Ed Harrington as a representative for the International Hearing Foundation, and Mike Paparella as the mastermind behind this scheme and as a representative for Sheldon Reese.

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25-29 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

SEPTEMBER, 1986

5-6 **Medical Directors** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

8-12 **49th Annual Radiology Course** Gastrointestinal and Abdominal Imaging and Interventional Radiology; CME, Medical School, University of Minnesota; Willey Hall/Marriott Hotel, 225 19th Avenue SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

8-19 **Fourth Annual Occupational Health and Safety Institute** School of Public Health and Office of CME; University of Minnesota Continuing Education and Extension, Midwest Center for Occupational Health and Safety; Earle Brown Continuing Education Center, University of Minnesota, 1890 Buford Avenue, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, Continuing Education, Midwest Center for Occupational Health & Safety, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3992.

11-12 **The First 30 Minutes: A Comprehensive Review of the Diagnosis and Management of Pediatric Emergencies** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Medical Education Coordinator, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55410; (612) 874-5884.

14-19 **Critical Issues in Health Laboratory Practice** CME, Medical School, University of Minnesota; Spring Hill Center, 725 County Road 6, Orono, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

15-19 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

18-19 **Annual Trauma and Critical Care Seminar** CME, Medical School, University of Minnesota; Pillsbury Auditorium, HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

18-20 **Teaching Geriatric Medicine** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55414; (612) 626-5525.

19 **Pediatric Update** St. Paul-Ramsey Medical Center; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota 55102. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

22-26 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

26 **Northwestern Pediatric Society Annual Meeting** Northwestern Pediatric Society; Thunderbird Hotel, 2201 East 78th Street, Bloomington, Minnesota. CONTACT: Mark Nammacher, M.D., 6845 Lee Avenue North, Brooklyn Center, Minnesota 55429; (612) 566-9500.

26-27 **Adolescent Medicine Conference: High Risk Youth** CME, Medical School, University of Minnesota; Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

26-27 **Sexual Attitude Reassessment Seminar** Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Diane Campbell, Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota 55414; (612) 376-7520.

OCTOBER, 1986

1-3 **Annual Internal Medicine Review** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

3 **Chemical Exposures: Emergency Response & Management** St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

6-10 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International

October (continued)

Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

8-11 **Principles of Colon and Rectal Surgery** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

9-10 **Family Practice Update** St. Paul-Ramsey Medical Center; Holiday Inn East, I-94 and McKnight Road, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

15-18 **The 20th Annual Orthopaedic and Trauma Seminar** Hennepin County Medical Center; Pillsbury Auditorium, HCMC, 701 Park Avenue South, Minneapolis, Minnesota. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office - 813, 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2812.

17 **Current Concepts in Cardiology of the Elderly** CME, Medical School, University of Minnesota; Pillsbury Auditorium; HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

18-19 **Update in Cardiology**, Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-22 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-24 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

22-24 **Obstetrics and Gynecology Annual Autumn Seminar** CME, Medical School, University of Minnesota; Marriott Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

23-25 **Emergency Medicine for Primary Care Physicians**; St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

24 **E.T. Bell Pathology Symposium** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

NOVEMBER, 1986

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

7 **Pediatric Orthopedics: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55404; (612) 874-5884.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

13-15 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota; (612) 221-3980.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

17-21 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

DECEMBER, 1986

1-5 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

4-6 **Coronary Heart Disease** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

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USED MEDICAL EQUIPMENT: We Buy, Sell, Appraise, Liquidate, and Consign Used Equipment. From one piece to a whole hospital. Contact: Bob Godar at Scientific Locators, PO Box 29231, Brooklyn Center, Minnesota 55429; (612) 566-4953. 3-9/86

NEUROSURGEONS: One or two American-trained, Board Certified/Eligible Neurosurgeons needed by our 150-member multispecialty (one neurosurgeon) Medical Staff and Hospital in St. Cloud, Minnesota. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The Hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

NEONATOLOGIST: Board Certified/Board Eligible American-trained Neonatologist needed to develop a Level III Nursery in Central Minnesota. Active support by 9-member Pediatric Department. Complete fully equipped Respiratory Department. Excellent Nursery Facility and Equipment. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The Hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

PHYSIATRIST: A Medical Director is needed for our Rehabilitation Unit who is an American-trained, Board Certified/Eligible Physiatrist. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota, 70 miles northwest of Minneapolis/St. Paul, with a 150-member multispecialty medical staff. St. Cloud Hospital is a Level II trauma and emergency facility. The Rehabilitation Unit has a large (200,000 population) referral area. The present rehabilitation unit is DRG exempt, modern, fully equipped, staffed with 40 professionals (including PT, OT, speech pathologist, TR) with an outstanding 16-year history and is actively supported by the Medical Staff. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

PHYSICIAN OPPORTUNITIES available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write: Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Physician or General Internist needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first-year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth, which provides excellent referral and continuing education resources. Call collect: (218) 834-2171, or write: Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

Lutsen Sea Villa: two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $85,000 - $80,000. Call: Jim (612) 333-8361. (R)

Family Practitioner needed to join two FPs at the Ellsworth, Wisconsin, office of a progressive 11-physician group. Liberal fringes and financial package. Forty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. (R)

Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Minnesota-based mental health corporation seeks candidates for consulting psychiatrist. 12 day/month. Salary: $4,500/month plus 50% of fees billed. Travel required. Board certified in psychiatry. Send resume to: T. Mulliken, 450 North Syndicate, Suite 20, St. Paul, Minnesota 55104. 1-8/86

Gastroenterologist or Internist with subspecialty interest in gastroenterology (have all the equipment). Obstetrician/gynecologist, general surgeon, internist, family practice in 18-physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well-equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Family Physician: Four-man family practice group needs to replace two leaving partners. Board eligible or certified desired. One-year salary with partnership thereafter. Would also consider long-term locum tenens. Small town in Central Minnesota lakes area. Unopposed family practice clinic, 150-bed regional hospital at Brainerd, 100-bed nursing home, rotate calls. Call or write: C.R. Pelzl, M.D., Pine River Medical Clinic, Pine River, Minnesota 56474; (218) 587-4416. (R)

Immediate Opening: Family Practitioner—River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes of the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman, or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona-based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

Canterbury Inn Bed & Breakfast: Rochester's unique alternative to hotel living. Victorian charm with modern comforts. Private baths, fireplace, central air conditioning, gourmet or special diet breakfast anytime, "tea-time" (wine, hors d'oeuvres, etc.) daily. Private, off-street parking, three blocks to Mayo Clinic and St. Mary's. A very special place for you, your colleagues, and your patients while in Rochester. $50/single, $60/double. 723 Second Street SE, Rochester, Minnesota 55902; (507) 289-5553. (R)

Bemidji Clinic, Ltd. offers excellent opportunities for well-trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first-year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator, or N.A. Skogerboe, M.D., Medical Director; (218) 751-1280. (R)

Family Practice: Associate needed to join four-man group, all ABFP, one member leaving soon due to health and family reasons. 65-miles north of Minneapolis, city of 2,200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact: Keith Clinic, PA, 160 SW Second Avenue, Milaca, Minnesota 56353; or call collect (612) 983-6101. (R)

Wanted: Family Practitioner—Ob/Gyn Group practice, central Minnesota. Starting salary $55,000. Write: Minnesota Medicine (755), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Practice: Northridge Family Medicine Clinic, PA, is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Psychiatrist: Our exclusive client, a rapidly growing national organization committed to providing high-quality cost-effective patient-oriented mental health and substance abuse services, seeks Adult Psychiatrist (BE/BC) for full-time staff opening in the Twin Cities. Position involves direct services, supervision, and consultation in a multidisciplinary clinical setting. Professional team includes Psychiatrists, LPs, LCPs, CCSWs, Psychiatric Nurses, and Certified Chemical Dependency Counselors. Salary to $100,000 (DOQ/DOE) plus benefit package of 20% of base salary plus bonus potential of up to 10% plus negotiable relocation expenses plus client organization will pay our agency service fee. If you think that you'd enjoy the freedom and independence of private practice with none of the financial risks, total personal and professional satisfaction, and highly attractive hours, please write or call collect in confidence on Job #3023 at: (612) 926-6584, Jerry Neren, Physician Recruiter, MedSearch Corp., Southdale Medical Building, 6545 France Avenue South, Edina, Minnesota 55435. 2-7/86

Family Practice: Hastings Family Practice, PA, is looking for a female BC/BE FP to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send CV to: D.R. Eckes, M.D., 1280 Ninninger Road, Hastings, Minnesota 55033; or call (612) 437-8666. 3-8/86

Thinking of Sun Belt Retirement? FP couple seeking GP/FP to help in office 2-3 days per week while we expand our family. Easy commute from Dallas. Adjacent to large lake and two country clubs. Call or write: S. Spain, M.D., Box 667, Kemp, Texas 75143; (214) 498-2033. 3-8/86

Writing Assistance for medical journal articles, patient information brochures, marketing brochures. Ten years of experience in health care writing. Call Elaine Lampert, Freelance Writer (612) 447-5883. 3-8/86

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, MN. The hospital is well-equipped with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department, and well-equipped surgery department. Fairmont is unique with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, Minnesota 56031. 4-9/86

FP/GP Locum Available For Work Lic. Minnesota, Wisconsin, SD, ND, Colorado, Utah, Missouri. Contact: Dr. Olin, 21450 Excelsior Boulevard, Excelsior, Minnesota 55331; (612) 474-1050. 2-8/86

Board Certified Internist, Oncologist, or Gastroenterologist (willing to do General Internal Medicine) to join expanding group of Internists with offices in downtown Minneapolis and western suburb. Excellent benefits and earning potential. Opportunity to work with young academically motivated group. Please contact: Dr. R.W. Kaufman or Dr. J.P. Kieley; (612) 339-7171. 1-8/86

Family Practice Physician: Ramsey Clinic, a University affiliated, multispecialty facility in St. Paul, has immediate opportunities for several family practice physicians. Your responsibilities would involve general family medicine including obstetrics along with an ideal opportunity to be involved in academic activities within the Department of Family Medicine at St. Paul-Ramsey Medical Center. We currently have openings in several practice sites including urban, suburban, rural Wisconsin, and rural Minnesota all within 60 miles of St. Paul. For immediate consideration, please send your CV in confidence to: David J. Mersy, M.D., Satellite Medical Director, Ramsey Clinic, 640 Jackson Street, St. Paul, Minnesota 55101. An Equal Opportunity Employer. 2-8/86

Family Practice Physician Assistant NCCPA certified. Desires to join established clinic. Present duties include Family Practice, Pediatrics, GYN, Orthopedic fracture care, and minor surgery. Experience in manning branch clinic. Trained first assistant in major surgery. New Minnesota legislation allows greater versatility of PA-Cs. CV on request. Mark Shoemaker: Days (218) 741-4292, Evenings (218) 229-2789. 2-8/86

Growing West Suburban Lake Minnetonka Clinic adding one full-time Pediatrician. Multispecialty: Family Practice, Internal Medicine, OB/GYN, Surgery, Orthopedics, Urology, Ophthalmology, Pediatrics. 15-physician clinic. Three offices. Quiet, rural area, allowing easy access to downtown Minneapolis. Immediate interviewing. Forward CV to: Mound Medical Clinic, Ltd., 2208 Commerce Boulevard, Mound, Minnesota 55364, Attn: Diane Theis; (612) 472-1144. 2-8/86

Wanted in Northfield, Minnesota Family Physician, BE/BC, FP residency graduate to join growing two-man group in Northfield. OB and surgical skills desirable. Open hospital staff. Guaranteed salary plus productivity incentive. Full partnership one year. Please contact: Dr. David C. Halvorson or Dr. Donald L. Lum, 500 South Water Street, Northfield, Minnesota 55057; (507) 645-4444. 3-9/86

Ob-Gyn needed for busy, modern practice with one female board certified OB-GYN in suburban St. Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

Psychiatrist board eligible/certified wanted for 11-M.D. Psychiatry Department of a University-affiliated group practice. Inpatient, outpatient, chemical dependency, prepaid, consultation, forensic, and subspecialty activities, active education, and research program. Full medical school faculty appointment, teaching and research interests desirable. Outstanding benefits, minimal on-call. Equal Opportunity Employer. Write: Minnesota Medicine (801), 2221 University Avenue, SE, Suite 400, Minneapolis, Minnesota 55414. 3-9/86

Pediatrician: Excellent opportunity to join four pediatricians in a very active practice. Growing community, excellent hospital with teaching opportunities available. Close to Milwaukee. Contact: John R. Guy, M.D., 1111 Delafield Street, Waukesha, Wisconsin 53188; (414) 542-2536. 3-9/86

Internist: Aspen Medical Group, PA, a physician-owned/managed multispecialty group practice in Minneapolis/St. Paul is now seeking internists for immediate openings. Salary and benefits are competitive. If interested, please send CV to: Maureen K. Reed, M.D., Aspen Medical Group, 1020 Bandana Boulevard West, St. Paul, Minnesota 55108. 3-9/86

Family Practice, Internal Medicine, and General Surgery positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken

Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

Family Practice: Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic PA, 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

Family Physician wanted for rapidly growing, progressive family practice group in St. Paul. Some community service work. Contact: Tim Rumsey, M.D., 545 West Seventh Street, St. Paul, Minnesota 55102; (612) 293-9199. 2-8/86

Family Practitioner wanted for branch offices of Park Nicollet Medical Center. Northern or southern suburbs of Minneapolis. Growing active practice. Full range of benefits. Contact: Milton Hanson, M.D., Park Nicollet Medical Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 931-2922. 3-9/86

Family Practice Specialist: Marshfield Clinic Department of Family Medicine is seeking a BE/BC Family Practitioner to replace a retiring colleague. The physician joining this six-member department will enjoy the support of one of the nation's largest multispecialty groups, share the philosophy of family oriented care with a preventive focus, and enjoy full hospital privileges but without the distractions of OB or surgical responsibilities. Marshfield Clinic offers an excellent salary plus extensive fringe benefits. Please send CV to: John Folz, Assistant Director, Marshfield Clinic, Marshfield, Wisconsin 54449; or call collect (715) 387-5181. 3-9/86

Physicians Needed: Over 400 opportunities nationwide!! Call (612) 786-1929 or send CV to: Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. 1-8/86

Family Physician needed to replace retiring partner in thriving 3-FP full-service practice in Starbuck, Minnesota, on the state's 13th largest lake. Good hunting and fishing. Modern nine-year-old hospital. Twenty miles to university campus. Call or write: Robert Bosl, M.D., Starbuck Clinic, PA, Starbuck, Minnesota 56381; (612) 239-2231. (R)

Physician Preceptor in Family Practice. Upper Peninsula Health Education Corporation is accepting applications for a full-time family physician in a unique, rural medical education center. Responsibilities are patient care including obstetrics and clinical instruction of medical students of the Upper Peninsula campus of Michigan State University's College of Human Medicine. Requirements are board eligibility or certification in family practice with a commitment to medical education. Salary and rank commensurate with experience. Send inquiries to: John Hickner, M.D., Bay de Noc Family Health Center, Doctors Park, Escanaba, Michigan 49829; (906) 786-9510. 4-11/86

Island for Sale: Beautiful one and one-half acre wooded island with three-bedroom log cabin on Farm Island near Mille Lacs. Property includes the entire island, cabin with fireplace, large storage barn, small boathouse on island; also 50 feet of lake frontage on shore. Electricity, running water, full kitchen (complete with utensils and appliances), and a three-quarter bath. Large beach with sandy bottom. Also includes speedboat and outboard motor and pontoon boat with motor. For further information: call Jim Ruttger at (218) 829-2222 or Bob Mattison at (612) 870-6878 or (612) 522-5353. 1-8/86

Family Physician/EmergencyRoom: Full-time salary working weekends; primarily emergency room. Flexibility available. Falls Medical Center, PA, 105 Shorewood Drive, International Falls, Minnesota 56649. Please contact: Douglas A. Johnson, M.D., or A. Marc Gorden, M.D., at (218) 283-9431 for more information. (R)

Emergency Medicine Physician: Ramsey Clinic, a University affiliated multispecialty clinic located in St. Paul, Minnesota, seeks a board certified or board eligible emergency medicine physician to join our 160-physician group practice. Through our association with St. Paul-Ramsey Medical Center, you will be providing clinical services in a large volume emergency room. Teaching and research opportunities are also available. Salary is commensurate with experience and excellent fringe benefits are offered a part of this opportunity. For further information and confidential consideration, send your CV in confidence to: Wayne F. Hass, M.D., Associate Chief, Department of Emergency Medicine, Ramsey Clinic, 640 Jackson Street, St. Paul, Minnesota 55101. An Equal Opportunity Employer. 1-8/86

Pediatricians: Multispecialty groups throughout Illinois, Indiana, and Wisconsin. Call or write: Jean Malkasian, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Psychiatry Illinois, Wisconsin—private practice or partnership options. Call or write: Jean Malkasian, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Internal Medicine: Multispecialty group opportunities throughout Wisconsin, Illinois, Indiana, and Virginia. Call or write: Jean Malkasian, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Onocologist or Hematology/Oncology Specialist 330-bed hospital with 11-county regional cancer treatment program in Fond du Lac, Wisconsin. 100% subspecialty practice. Extensive laboratory and diagnostic equipment. Call or write: Jean Malkasian, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Obstetrician/Gynecologist: We represent clients in Illinois, Iowa, Michigan, Montana, North Dakota, and Wisconsin. Opportunities with multispecialty groups, partnership, and solo fee-for-service positions are available. For detailed information, please send your CV or call: Jim Huber, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Ophthalmology: Position available in western Wisconsin, lake setting, two hours from Twin Cities. Multispecialty and partnership opportunities available in Illinois. Please send your CV or call: George Ivekich, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Neurosurgeons: We represent clients in Illinois, North Dakota, and Iowa. Opportunities with multispecialty groups and fee-for-service positions are available. Please send your CV or call: George Ivekich, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Obstetrician/Gynecologist Montana, to affiliate with 198-bed hospital near Rocky Mountains. Second largest city in Montana, offering abundant outdoor recreational opportunities and cultural activities. Immediate need. Send CV to: Dorothea Anich, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Orthopedic Surgeons: Opportunities available with multispecialty groups in attractive settings in Wisconsin, Illinois, and scenic Virginia. Partnership situation promising busy caseload available in Colorado. Send CV to: Dorothea Anich, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Perinatologist: Excellent opportunity to become director of regional perinatal center in Green Bay, Wisconsin. Hospital is 517-bed acute care facility serving northeastern Wisconsin and parts of Michigan's Upper Peninsula. Financial arrangements and incentives completely negotiable. Send CV to: Dorothea Anich, Fox Hill Associates, 250 Regency Court, Waukesha, Wisconsin 53186; (414) 785-6500 (collect). 1-8/86

Family Practitioner: Due to death of partner, a family practitioner is needed to join two remaining family practitioners in busy rural practice 175 miles west of Twin Cities. Serious candidates may obtain details about practice and community by contacting: Robert Ross, M.D., or Ronald Beyer, M.D., at Northside Medical Center; (612) 839-2516 or Richard Slieter, Administrator, Ortonville Area Health Services; (612) 839-2502 or by writing to the above at 750 Eastvold Avenue, Ortonville, Minnesota 56278. (R)

Board Certified Family Physician wanted as fourth physician in progressive nonprofit neighborhood clinic also serving metro-wide Hispanic community of St. Paul. Obstetrics included. Bilingual (Spanish) preferred or willingness to learn. Contact: Dr. Bruce Richardson or Gary Sande at (612) 222-1816 or write: West Side Community Health Center, 153 Concord Street, St. Paul, Minnesota 55107. 1-8/86

Multispecialty group practice in Buffalo seeks family practice, pediatrics, and ob/gyn practitioners. Buffalo Clinic has five offices with 18 full-time physicians. Contact: Mary Donahue or Linda Dircks at Buffalo Clinic, PA, 1700 Highway 25 North, Buffalo, Minnesota 55313 (612) 682-1313. 1-8/86.

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General Internist: The St. Cloud Medical Group located in Central Minnesota has an immediate opening for a general internist to join a 23-physician, multispecialty group in St. Cloud, Minnesota. The department of internal medicine currently has four board certified internists, and is in the process of recruiting an additional board certified internist to that department. This opportunity affords a general internist a great financial and working opportunity. St. Cloud is one of the fastest growing communities in the state of Minnesota and is home to three major colleges. It is geographically located to provide quick access to the Metropolitan Twin Cities area. The St. Cloud community has excellent school systems available to the individual physician and his or her family members. If interested in this excellent opportunity, please call collect either Dr. Ronald Elg and/or Daryl G. Mathews, Administrator, at (612) 251-8181, and/or send CV to: St. Cloud Medical Group, PA, 1301 West St. Germain Street, St. Cloud, Minnesota 56301. 4-11/86

General Internist: We are in need of a qualified internist, preferred board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic located next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write: James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072; (612) 245-2212. 6-12/86

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Cover Photograph

Grazing in the Remarkables

John C. Wander, M.D., took the cover photograph while traveling with his family through the Remarkables, a group of mountains south of Queenstown, New Zealand, in September—early spring in that part of the world.

He used a Nikon FA with a 35-105 zoom lens and Kodachrome ASA 64 film.

Dr. Wander, a family practitioner, lives in St. Paul and practices in White Bear Lake.

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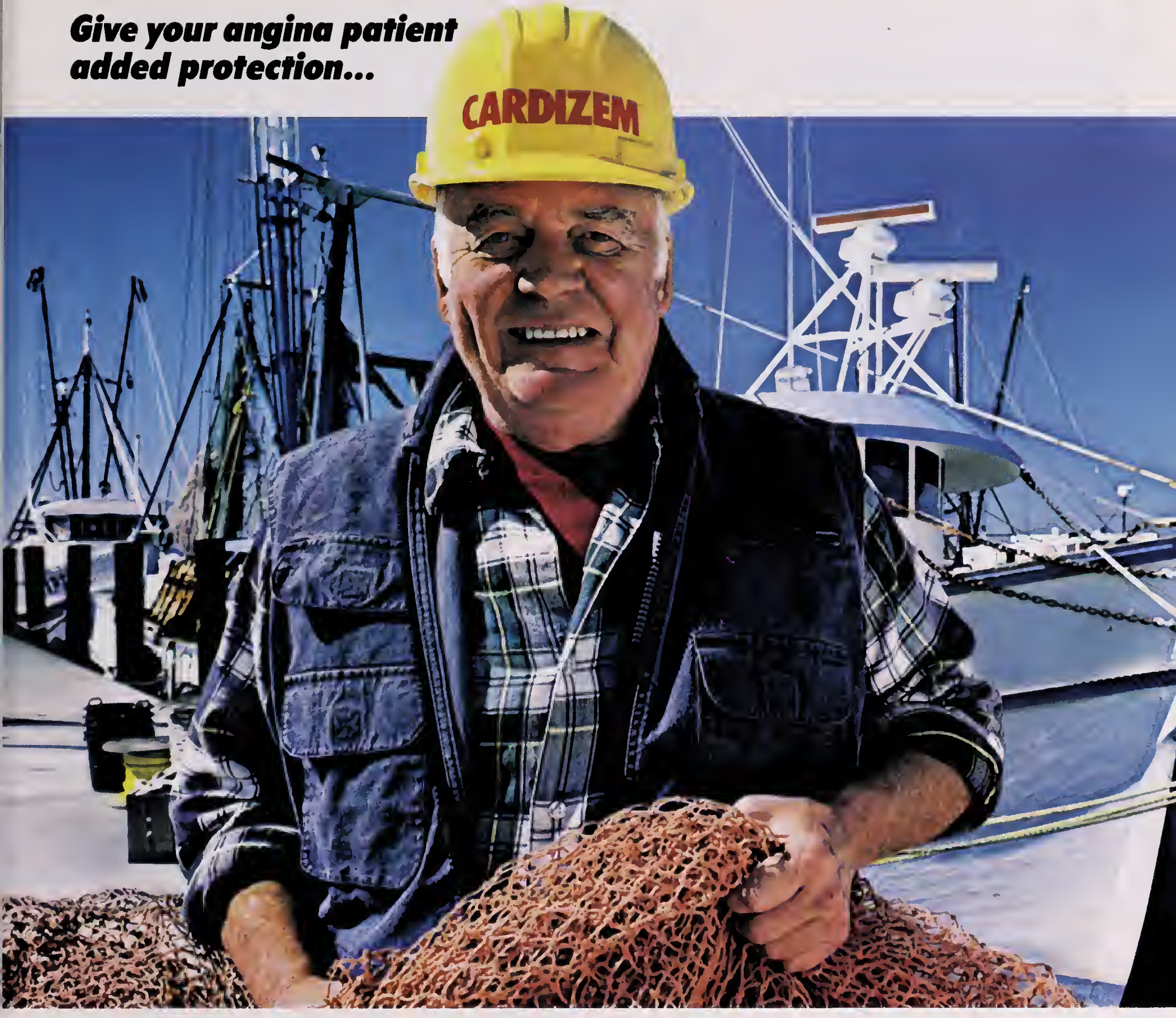

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Please see brief summary of prescribing information on the next page.

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CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** *CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1,243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.*
2. **Congestive Heart Failure.** *Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). An acute study of oral diltiazem in patients with impaired ventricular function (ejection fraction 24% ± 6%) showed improvement in indices of ventricular function without significant decrease in contractile function (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is limited. Caution should be exercised when using the drug in such patients.*
3. **Hypotension.** *Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.*
4. **Acute Hepatic Injury.** *In rare instances, significant elevations in enzymes such as alkaline phosphatase, CPK, LDH, SGOT, SGPT, and other symptoms consistent with acute hepatic injury have been noted. These reactions have been reversible upon discontinuation of drug therapy. The relationship to CARDIZEM is uncertain in most cases, but probable in some. (See PRECAUTIONS.)*

PRECAUTIONS

General. *CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.*

Drug Interaction. *Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS.)*

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. *A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity. There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.*

Pregnancy. *Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality. These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.*

There are no well-controlled studies in pregnant women, therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. *Diltiazem is excreted in human milk. One report suggests that concentrations in breast milk may approximate serum levels. If use of CARDIZEM is deemed essential, an alternative method of infant feeding should be instituted.*

Pediatric Use. *Safety and effectiveness in children have not been established.*

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy.

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established. The most common occurrences as well as their frequency of presentation are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%). In addition, the following events were reported infrequently (less than 1%):

Cardiovascular:	*Angina, arrhythmia, AV block (first degree), AV block (second or third degree — see conduction warning), bradycardia, congestive heart failure, flushing, hypotension, palpitations, syncope.*
Nervous System:	*Amnesia, gait abnormality, hallucinations, insomnia, nervousness, paresthesia, personality change, somnolence, tinnitus, tremor.*
Gastrointestinal:	*Anorexia, constipation, diarrhea, dysgeusia, dyspepsia, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH (see hepatic warnings), vomiting, weight increase.*
Dermatologic:	*Petechiae, pruritus, photosensitivity, urticaria*
Other:	*Amblyopia, dyspnea, epistaxis, eye irritation, hyperglycemia, nasal congestion, nocturia, osteoarticular pain, polyuria, sexual difficulties.*

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: alopecia, gingival hyperplasia, erythema multiforme, and leukopenia. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established. *Issued 11/85*

See complete Professional Use Information before prescribing.

References: 1. *Frishman WH, Charlap S, Goldberger J, et al: Comparison of diltiazem and nifedipine for both angina pectoris and systemic hypertension. Am J Cardiol 1985;56:41H-46H.* **2.** *Weiner DA, McCabe CH, Cutler SS, et al: The efficacy and safety of high-dose verapamil and diltiazem in the long-term treatment of stable exertional angina. Clin Cardiol 1985;7:648-653.* **3.** *Pepine CJ, Feldman RL, Hill JA, et al: Clinical outcome after treatment of rest angina with calcium blockers: Comparative experience during the initial year of therapy with diltiazem, nifedipine, and verapamil. Am Heart J 1983;106(6):1341-1347.* **4.** *Cohn PF, Braunwald E: Chronic ischemic heart disease, in Braunwald E (ed): Heart Disease: A Textbook of Cardiovascular Medicine, ed 2. Philadelphia, WB Saunders Co, 1984, chap 39.* **5.** *McCall D, Walsh RA, Frohlich ED, et al: Calcium entry blocking drugs: Mechanisms of action, experimental studies and clinical uses. Curr Probl Cardiol 1985;10(8):6-80.* **6.** *Chaffman M, Brogden RN: Diltiazem: A review of its pharmacological properties and therapeutic efficacy. Drugs 1985;29:387-454.* **7.** *Schroeder JS: Calcium and beta blockers in ischemic heart disease: When to use which. Mod Med 1982;50(Sept):94-116.* **8.** *Shapiro W: Calcium channel blockers: Actions on the heart and uses in ischemic heart disease. Consultant 1984;24(Dec):150-159.* **9.** *Johnston DL, Lesoway R, Humen DP, et al: Clinical and hemodynamic evaluation of propranolol in combination with verapamil, nifedipine and diltiazem in exertional angina pectoris: A placebo-controlled, double-blind, randomized, crossover study. Am J Cardiol 1985;55:680-687.*

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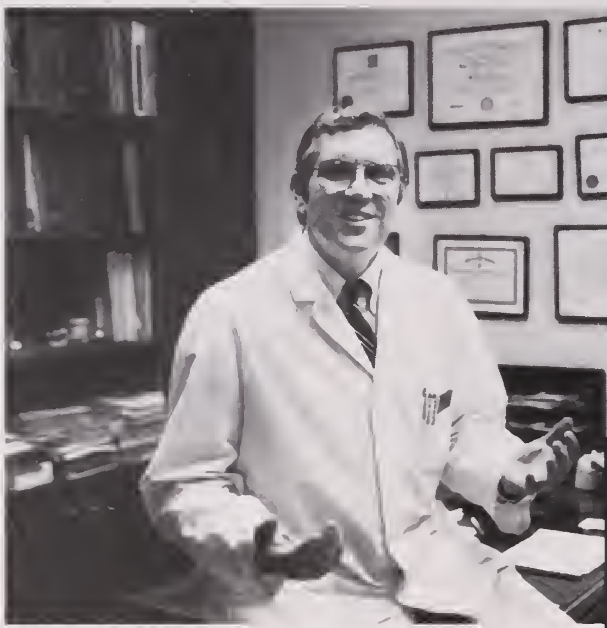

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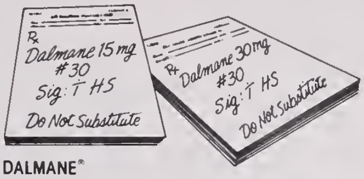
References: **1.** Koles J, *et al: Clin Pharmacol Ther 12*:691-697, Jul-Aug 1971. **2.** Kales A, *et al: Clin Pharmacol Ther 18*:356-363, Sep 1975 **3.** Kales A, *et al: Clin Pharmacol Ther 19*:576-583, May 1976. **4.** Kales A, *et al: Clin Pharmacol Ther 32*:781-788, Dec 1982. **5.** Frost JD Jr, DeLucchi MR. *J Am Geriatr Soc 27*:541-546, Dec 1979. **6.** Dement WC, *et al: Behav Med*, pp. 25-31, Oct 1978. **7.** Kales A, Kales JD. *J Clin Psychopharmacol 3*:140-150, Apr 1983. **8.** Tennant FS, *et al:* Symposium on the Treatment of Sleep Disorders, Teleconference, Oct 16, 1984 **9.** Greenblatt DJ, Allen MD, Shader RI: *Clin Pharmacol Ther 21*:355-361, Mar 1977.



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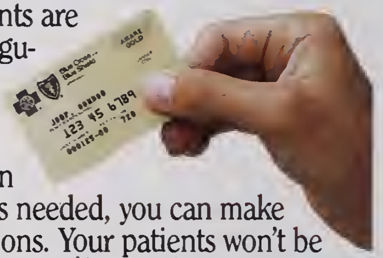

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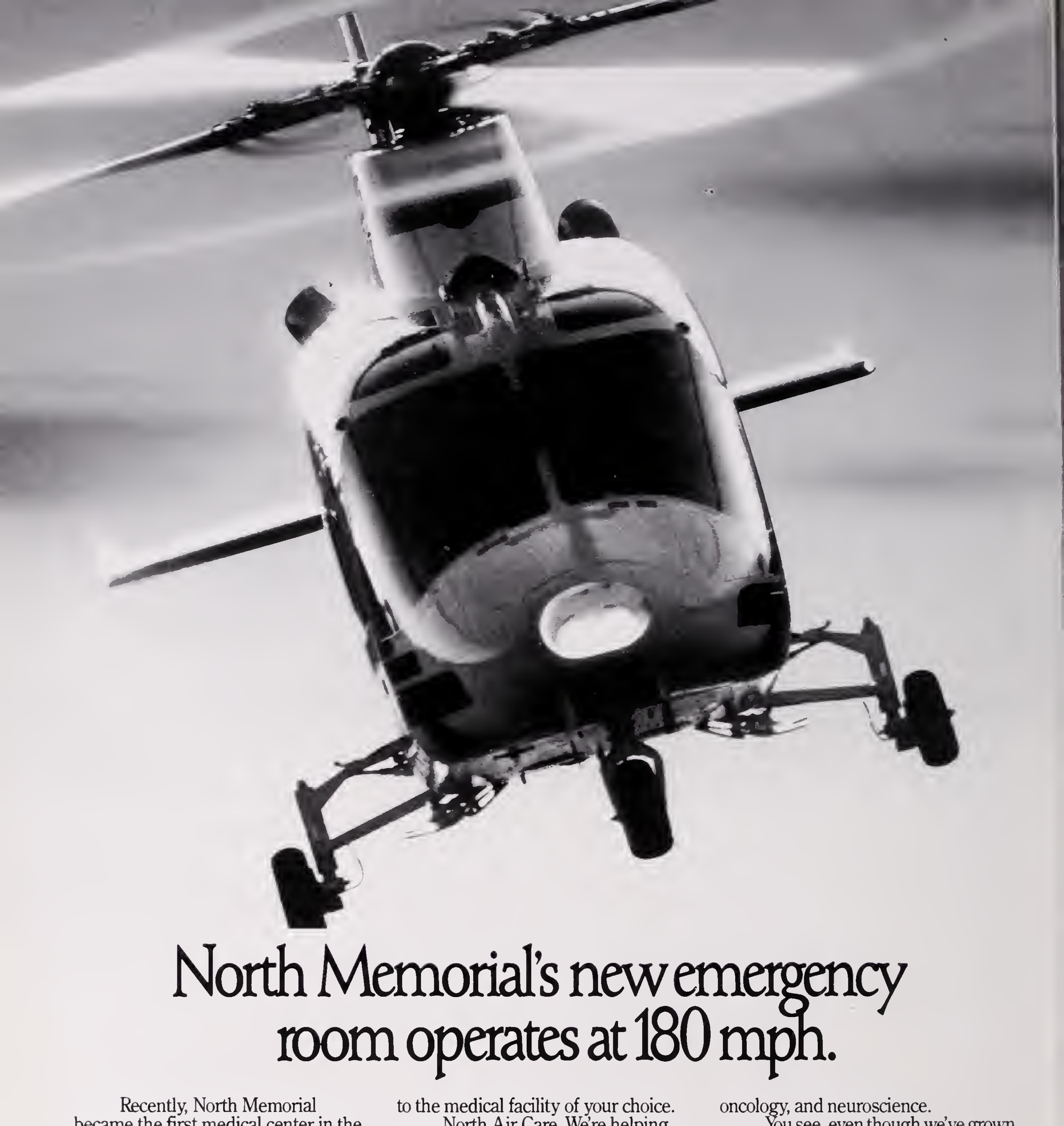

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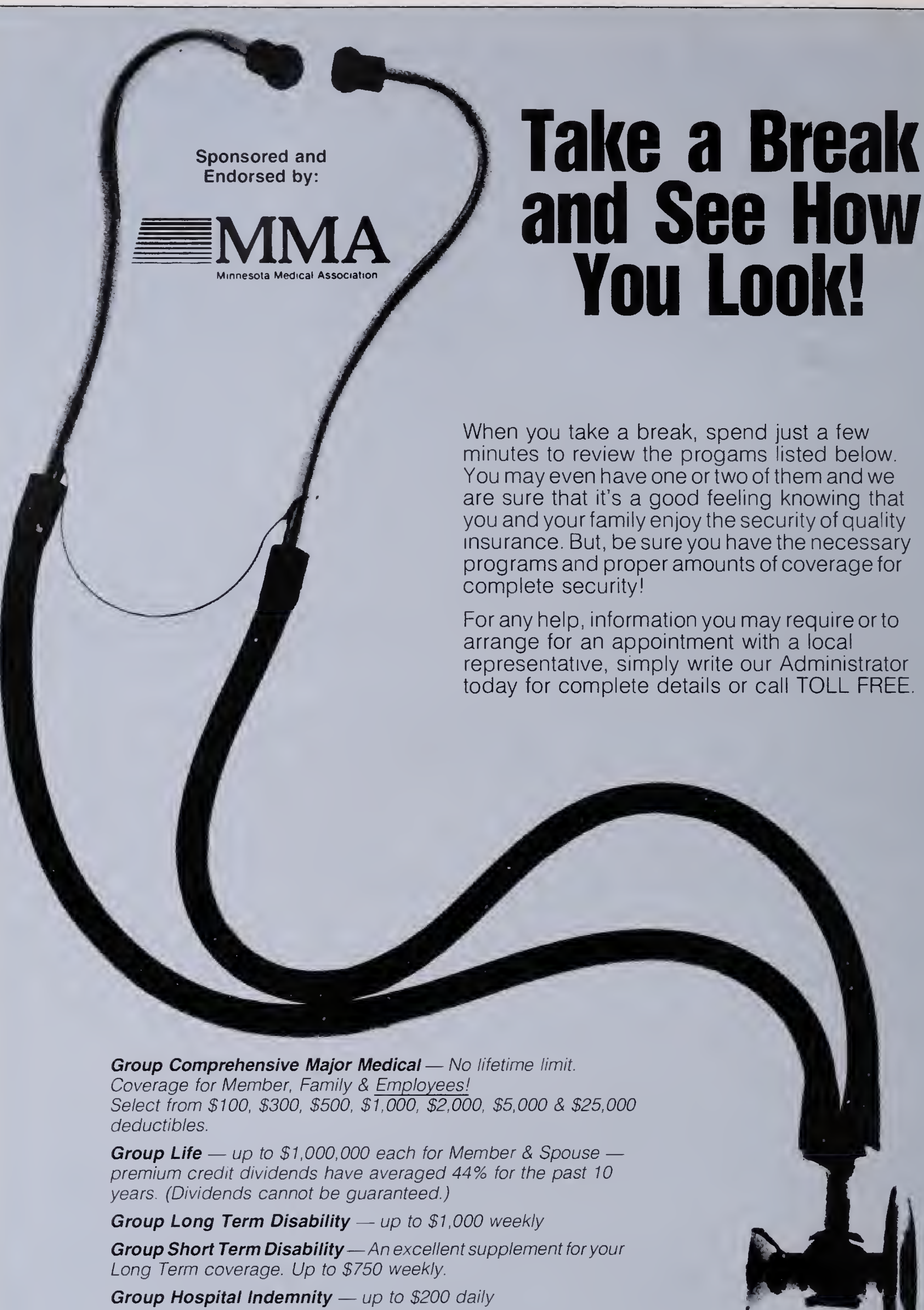

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President's Letter

On the Wedding Day: A Father's Counsel

James F. Knapp MD

James F. Knapp, M.D.
President
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Dear Daughter Sara and Son-in-law Mark:

With 25 years of eventful medical practice behind me, I would like to offer you some suggestions as you embark on your medical careers.

Medical doctors frequently ask one another if they'd recommend medicine to their sons or daughters. As you are in your third and fifth years of training, this is a moot question. Regardless, my answer would be yes. **I firmly believe that in spite of the external forces that are trying to control us, medicine remains among the most intellectually and emotionally satisfying of the professions.** We also earn comfortable livings, and this is likely to persist for at least the next decade.

To add to your individual success in medicine, may I offer the following:

1. **Your patient always comes first.** If you keep this simple principle before you, it will help you resist the blandishments of those who would change medicine from a profession to a business. This may limit your financial reward, but you will experience a much higher level of personal and professional fulfillment by holding onto the firm foundation of "patient first."

2. **Strive for superior skill and knowledge in one area of medicine.** This may be a general system or a single procedure. It is my observation that the lifelong students of medicine who are always striving for a better way of doing things are the most happy with their profession. In this connection, try to do some teaching. Teaching demands that you have accurate knowledge and that you are constantly updating it. It is also especially rewarding to share your expertise with others.

3. **Remain flexible and expect to recycle at least once.** *The one constant in medicine is and will be change.* You know about the half-life of medical knowledge, but perhaps you don't realize how we grow in medicine with changing interests, needs, and opportunities. Unfortunately, too often we preclude ourselves from these opportunities because we get locked into our non-medical situations. Time and again, I have heard financial advisers describe how M.D.s mismanage their assets, extend themselves for their lifestyle, and don't plan for exigency. An aphorism: "Manage your money so that you can manage your life, but don't let your money manage you."

4. **Finally, give some of your time to organized medicine**, in the form of your county or state association or your specialty society (be sure to get boarded in some phase of medicine). I have said before that medicine in this country is the best because it has the best science, education, delivery systems, and surveillance system in the form of organized medicine. The first three would not be so great without the fourth. In 1852, Wendell Phillips said that "eternal vigilance is the price of liberty," an apt quote when considering the role of organized medicine. Senator David Durenberger, who has recently spoken about generational equity, quotes Thomas Jefferson, "The first principle of government is that you leave the next generation—your children—with opportunities for choice which are no less than your own." My generation has tried to do this for you, though not always successfully. I hope you, and your colleagues, strive to do likewise for your children.

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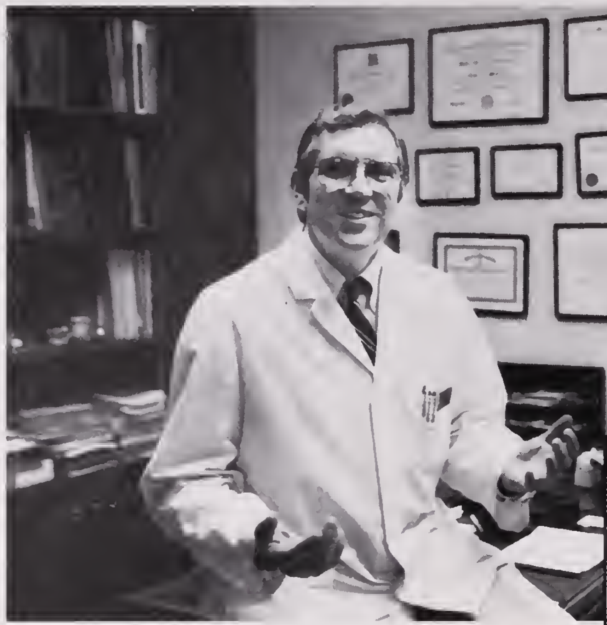

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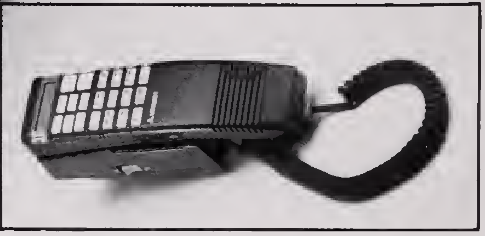

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Editor's Notebook

Corporate Transformation of Medicine in Minnesota: Rationing of Medical Care—Is it Inevitable?*

First of Two Parts

Twentieth in a Series

ration (rash' an/ra' shun) n, (Fr., < L ratio, rationis, proportion). A daily allowance of provisions to soldiers or sailors; any fixed amount of quantity allotted; a share or portion, pl. provisions - v.t. To supply with rations; to allot in a fixed amount; to issue provisions to; to limit or restrict the use of.

The Living Webster Encyclopedic Dictionary of the English Language

DULUTH - You have asked me to speak on a controversial topic, rationing of medical care. I do not feel comfortable with this subject.

For two reasons.

One, I finished medical school in 1960 and have practiced in the "Golden Age of Medicine"—that period between 1945 and 1980 when the government subsidized expansion of the United State's medical care system and dispensed money on either a fee-for-service or cost-plus basis. I am simply not accustomed to dealing with scarcity.

Two, to come to Duluth to talk about rationing of health care is like bringing coals to Newcastle. You have been rationing your health care dollars here for at least the last three years. You may have lost 25,000 of your population; your main industry, steel, is near bankruptcy; and your three hospitals are operating at one-third to one-half of capacity. Your medical industry, like your steel industry, is suffering from high costs, intense competition, over capacity, and decreased demand.

Boston and Duluth

I have just returned to Minnesota from Boston. In the Boston Globe, this verse was cited to illustrate how far from grace Republicans and WASPs (White Anglo-Saxon Protestants) have fallen:

This is good old Boston,
Land of the bean and the cod,
Where Lowells speak only to Cabots,
And Cabots only to God.

The Globe said the Republican party, a historic WASPs' nest, has not won a statewide election since 1978, has only 13 percent of registered votes, and cannot find a WASP candidate for governor. Democrats are so powerful and so liberal in Massachusetts that Republicans refer to the Bay State as the "People's Republic of Massachusetts."

---

*Presented at the third annual Lundberg Memorial Lecture, August 5, 1986, St. Luke's Hospital, Duluth, Minnesota. The views expressed here are my own and do not express the views of the Minnesota Medical Association or the Board of Editors of Minnesota Medicine.

Duluth deserves its own verse. I have come up with this one:

This is good old Duluth,
Land of the hoagi and the pike,
Where Peluccis speak to Perpiches,
And both to whomever they like.

This isn't good poetry, but it makes good sense. The verse captures the spirit of open democracy, easy access, ethnic diversity, and unfettered exchange you have here in Duluth. So perhaps this memorial lecture is a good forum to discuss the delicate subject of rationing of medical care.

Side Remarks

Before I do so, I would like to chew on an old bone. To have Doctor Aufderheide—former dean of the University of Minnesota Medical School in Duluth, a fellow pathologist, and a noted paleopathologist—introduce me honors me. What he said about me was correct. He has learned to be precise while classifying skeletons.

I understand Doctor Aufderheide believes high lead levels found in ancient Romans' bones may have resulted from overindulgence in the grape. Noble Romans may have fallen to the barbarians because they were ignobly stoned from too much wine. My question is: "*Wine* earth did they drink so much."

In his phone call inviting me to deliver this lecture, Doctor Aufderheide, knowing of my southern heritage, finally clinched his persuasive argument with this line: "You were *bone* to give this talk." As you all know, he can be flexible and even seductive when he wants something. I understand he was negotiating with a woman archaeologist in Peru about gaining access to mass graves of ancient hunters. He tried this line: "If you've got the *mummy*, honey, I've got the time."

In any event, because of my respect for Doctor Aufderheide, I shall try to make this talk as free from *ossified* ideas, *ankylosed* opinions, *humerus* thoughts, little white *fibulas*, *tibial* matters, *spurious* arguments, *callous* remarks, and pure *corn* as possible. If I commit any *boners*, Doctor Aufderheide has agreed to join with me in a *skull* session after the talk to arrange a *joint realignment* of the facts.

Why I'm Here

I am here on a serious matter—to give the annual Lundberg Memorial Lecture. Doctor Kay Lundberg was an anesthesiologist at St. Luke's Hospital for ten years. Four years ago, she died after she fell from a horse. In her honor, her husband and family have established an endowment fund to provide an annual speaker for a controversial subject relating to medical care.

Questions and Answers

My title is: "The Rationing of Medical Care—Is It Inevitable?"

My answer is "No" if you define rationing as in Britain where Her Majesty's government assigns 6 percent of its Gross National Product to health care, sets a budget cap, and says to physicians: "There it is—the amount of money you have to spend on health care. You ration it, and you rationalize how you want to spend it."

My answer is "Yes" if you define rationing as "managed health care" where managers allocate resources to achieve profit, to minimize losses, to concentrate on productive opportunities, to strengthen the organization, and to provide comprehensive care based on a prepaid budget or budgets constrained by gatekeeper methods, preadmission screening, utilization reviews, and fixed schemes such as Diagnostic Related Groups.

Editor's Notebook

"Managed Health Care" Already With Us

Let's face it. "Managed health care," "appropriate allocation of resources," or "budget and cost controls," are already with us. In the United States, HMOs grew by 4.3 million enrollees to 22.0 million members last year; the 170 or so Blues' plans across the country declared "managed health care" as a national strategy for their indemnity side and added HMOs as fast as they could; the Reagan Administration clearly wants to write Risk Contracts with health care corporations for both Medicaid and Medicare populations; and the Department of Defense has just announced a "managed care plan" whereby bids will be let for risk contracts for 6 million military retirees and dependents in three regions of the country for $500 million dollars for each bid.

Add to these events the knowledge that major corporations are conducting their own managed plans and risk contracts and self-funding, and you have "rationing" of money to provide health care. Or at least you have the end of the Golden Age of unfettered fee-for-service payments to physicians and retrospective cost reimbursement for hospitals. You have, in short, budgetary and cost controls at multiple levels.

Prototype Systems

At this point, I shall remind you of the three prototype health systems from which societies have to choose (actually most Western social democracies have mixed economies and combinations of at least two of the three) (Table 1).

TABLE 1
Prototype Health Systems

Prototype Systems	*Egalitarian Distribution*	*Freedom from Government Interference in Pricing*	*Budget and Cost Control*
Health Care Provider's Dream (FFS and Cost + for Hospitals)	Yes	Yes	No
National Health Care Insurance	Yes	No	Yes (Britain, Canada)
Price-Competition	No	Yes	Yes

Source, Reinhart UE: Future Trends in the Economics of Medical Practice and Care. Am J Cardiol 56:50C-59C, 1985.

Health Care Provider's Dream

The Health Care Provider's Dream—(1) no need to ration by price; (2) no need to ration by queue; (3) no need to ration by administrative decree; (4) no need to change the way providers or patients behave; (5) no need to monitor or to slow or gain access to technology; and (6) no need to restrain use of the system—is clearly over.

In the United States, the dream lasted roughly from just after World War II, when Hill-Burton passed; was boosted in the 1950s with tax deductions for health expenses and the founding of the Department of Health, Education, and Welfare; picked up steam when Medicare and Medicaid came into being in 1965; accelerated with the expansion of the number of medical schools and the number of medical students in the late 1960s; peaked about 1975 as educated doctors poured out of the pipelines and high-technology medical devices rolled off the assembly lines; and died in the early 1980s when the American people elected a conservative administration to cut government spending for social programs and to rebuild the Military Establishment.

Budget and cost controls in this new era will affect most physicians and most patients. Only a few selected physicians, with high demands for their services, either because of their specialty or their geographic location, and a few privileged patients, who will be able to pay for what they want, will slip through the cracks of managed care. America will always have its Park Avenue practices, just as the British still have their Harley Street. America, after all, has 40,000 millionaires, and many of them will be willing to pay for fee-for-service care from the best physicians and institutions.

"Rationing"—A Word Americans Avoid

"Rationing" is a word most of us prefer to avoid. It implies scarcity. It implies wartime. It implies emergency. It implies crisis. And it is a word most physicians find hard to understand in the face of the glut of physicians, hospital beds, and technology. What physicians have not yet grasped is that the rest of society has decided to "ration" the supply of money to support what they perceive as an irrational and wasteful health system.

"Ration" and "Rational"

You may find it instructive, as I do, that the word "rational" has the same Latin stem as "ration." Perhaps this is why proponents of national health insurance and of competitive markets say their models are the only "rational" ways to control prices and to assure equity. HMOs, I have heard Paul Ellwood say, are simply a means of "rationalizing" the health care system.

Americans Not Rational

But alas, Americans who want health care, particularly urgent health care, are not rational. They want what they want when they want it—and they want the best when they are sick. Most of them, to the surprise of staff model HMO experts, want their own doctors and their hospitals.

A Professor's View

A health care economics professor brought the lesson of consumer demand—and the latent schizophrenia of consumers—home to me several years back when he said: "When someone else is sick, I want the rational use of limited health care resources based on need, cost-benefit studies, and efficient providers. But when I am sick, or a member of my family is ill, I want my own doctor, and I want that doctor to pull out all the stops, spare no expense, leave no diagnostic stone unturned, use experimental drugs if necessary, and do whatever it takes."

Rationing—Difficult to Impose

Because of this consumer demand for the best in medical care, I believe government rationing of care will be difficult to impose on the American public. As my mother-in-law says, "It is easy to be spoiled by the best."

Yet we cannot have the best for everyone. I, for one, believe we shall inevitably have at least three different tiers of care: fee-for-service care for those who can afford it; corporate care through HMOs, PPOs, and other organizations for much of the middle class; and predominantly corporate care for the underprivileged and for the underinsured in the Medicare and Medicaid populations.

Because of a strong streak of individualism in American patients and because of an overwhelming desire of many educated health care professionals to act out their own destinies, I foresee a pluralistic, diversified, and multitiered system. We shall have large health care corporations, and many of these will be of the SuperMed type, but these corporations will have to conduct their business in a decentralized style, giving autonomy and initiative to physicians, or the corporations will lose their best talent.

As Eli Ginzberg pointed out in the book *Beyond Human Scale: The Corporation at Risk*, educated managers and professionals are not satisfied with large corporations.[1] These corporations are at risk in the competitive world because they can no longer attract and hold leaders, managers, and professionals devoted to the corporate cause. HMOs can now attract talented physicians. Can they hold them? Can they give them the equity, autonomy, and room for initiative so necessary to thinking and creative leaders?

Individualistic Americans

The Wall Street Journal recently carried results of a poll in which Americans were asked what their idea of a dream job for a year would be. Here are the results:

Men		Women	
Head of Own Business	38%	Head of Own Business	47%
Professional Athlete	30%	Tour Guide	30%
President Corporation	28%	Flight Attendant	27%
Forest Ranger	27%	Novelist	27%
Test Pilot	25%	Photographer	27%

This survey indicates to me that Americans are an individualist people. Perhaps we ought to be more concerned about the good of society or an organization. But we retain our personal fantasies of success in individual pursuits. As President Reagan has declared, this is the Age of the Entrepreneur. The hearts of independent entrepreneurs in control of their own destinies beat deeply in all of us. And no more than in physicians, who have educated themselves at great expense for 10 to 20 years past high school, and who have been trained to exercise their skills and judgment to do what is best for patients. The habits of the heart and mind are not easily broken.

Given the American spirit, I doubt if we will have a system like Britain—where topdown rationing results in a rate of coronary bypass one-sixth that of the United States, where one-half of patients do not receive renal dialysis or transplants, where patients have one-half as many X-rays using one-half as much film, where hip replacements are performed 75% as often as in the U.S., where suspected gliomas are not biopsied or treated, and where most myocardial infarcts are treated at home.

Why not?

Let's be candid. The American health care industry, like the defense industry, is a deeply embedded part of our economy. It is, therefore, difficult to dismantle or to cut its growth quickly. Try to close down a rural hospital or a Veterans hospital when it is the biggest employer in town, and you will learn why health care is an economic force and why it is difficult to control. Take the first quarter of 1986. Health care costs went up 8.7%, even though the Consumer Price Index fell by 1.9%. Hospital room charges (+ 10%), prescription drugs (+ 12%), and physician's fees (+ 7%) accounted for the increase. Why are costs so tough to control?

Well, American Health Care is:

- About as big as defense.
- About as measurable.
- About as dominated by professionals.
- About as emotional.
- About as important economically.
- About as much as a cost-plus business.
- But much more decentralized.

Health care, as Eli Ginzberg noted in his book *The Limits of Health Reform*, is a tough business to change because it means so much to so many people.[2] Health care is the largest employer in Minnesota. It has surpassed agriculture. Given the Duluth Clinic, your independent specialists, and your collection of nine hospitals, I would guess health care easily ranks as the No. 1 or 2 employer in Duluth.

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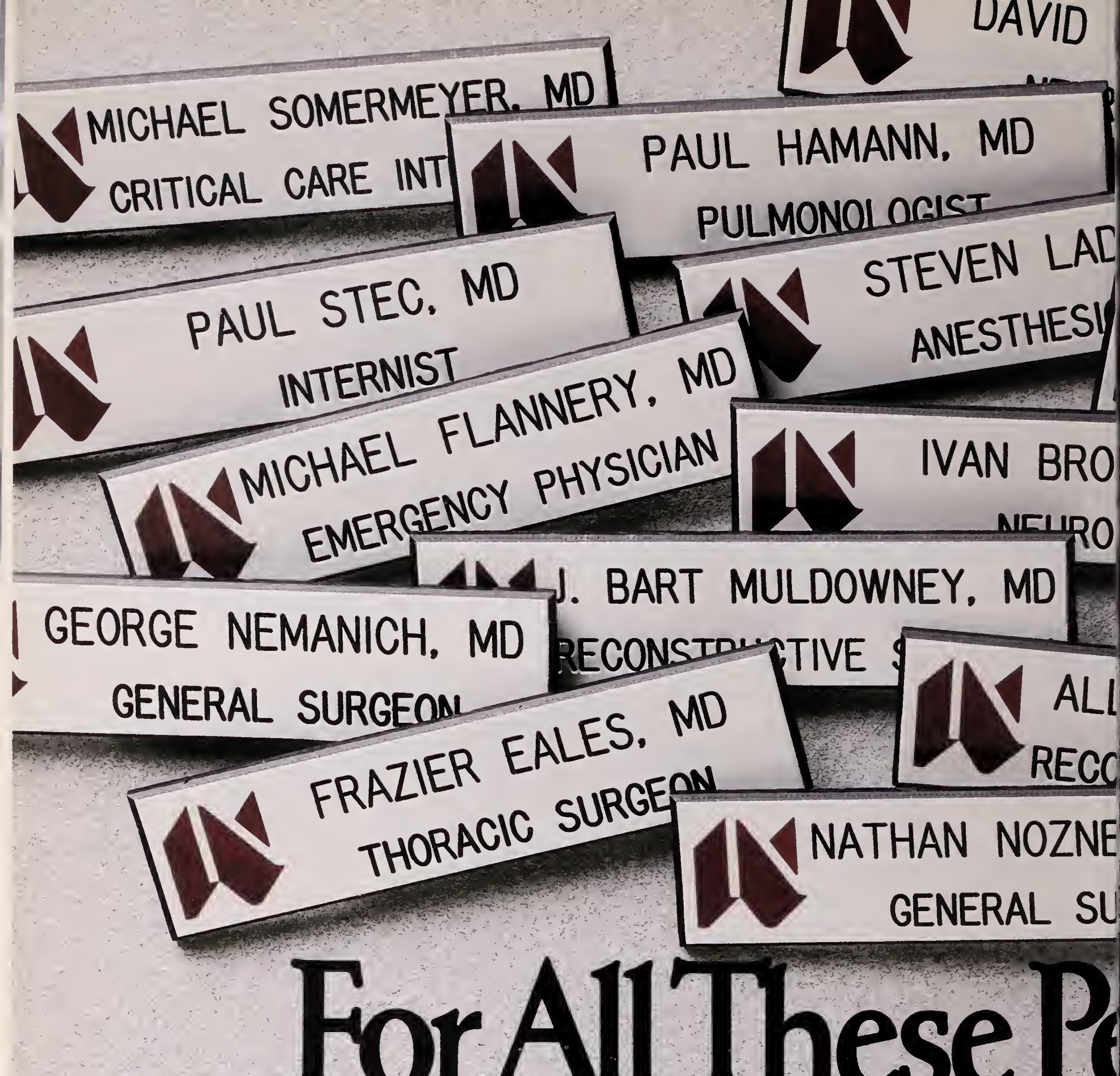
Richard L Reece MD

Part 2 of "Rationing of Health Care: Is it Inevitable?" will continue in the October issue of Minnesota Medicine.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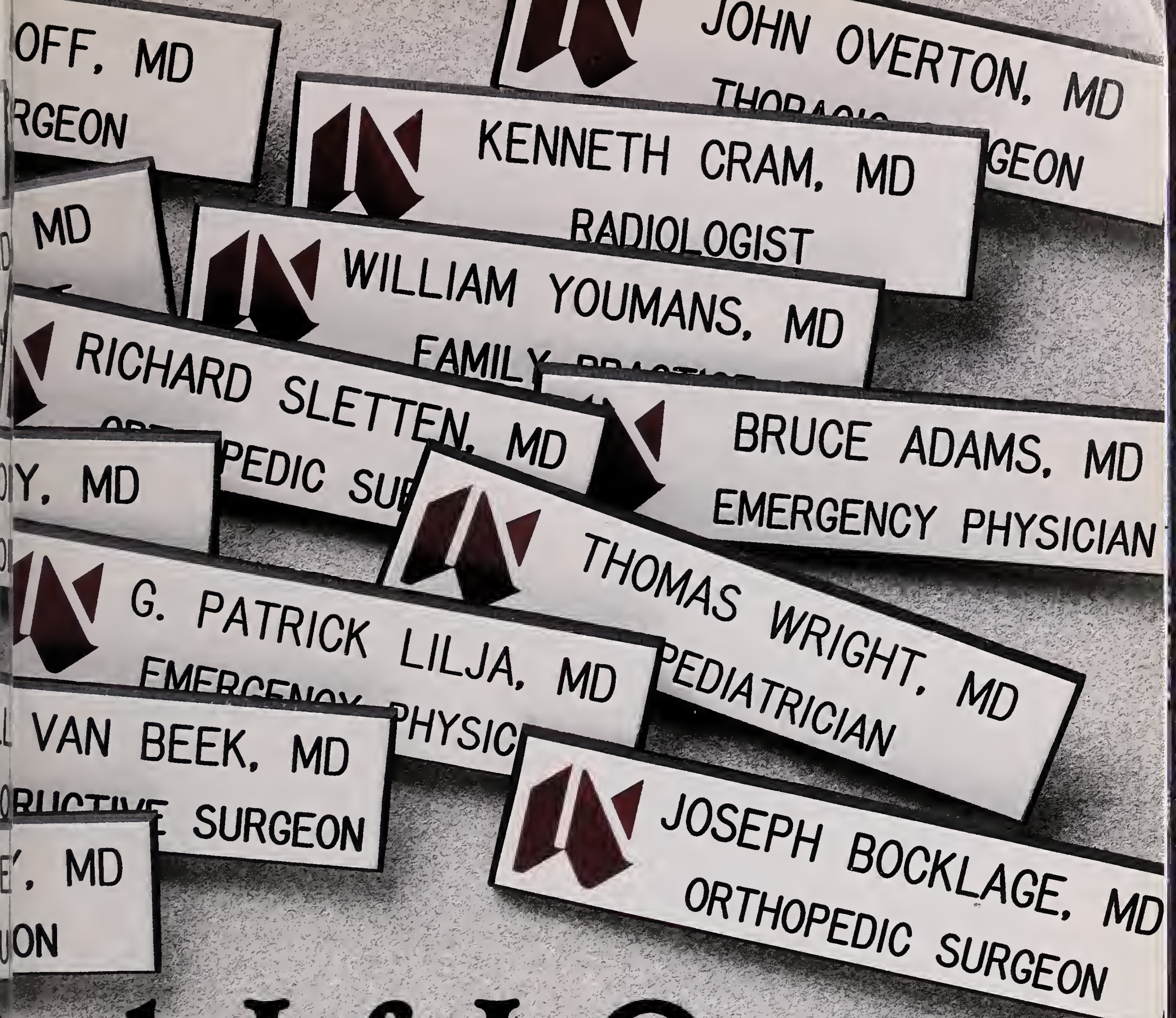
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Delivery in a Tertiary Care Perinatal Center Reduces Neonatal Intensive Care Costs

MARK C. MAMMEL, M.D., LaVOHN JOSTEN, R.N., M.S.N.,
BARBARA FULLER, B.S., J. MICHAEL COLEMAN, M.D.,
STEPHEN J. BOROS, M.D., and PETER E. FEHR, M.D.

We retrospectively analyzed medical records and inpatient hospital bills for 191 infants with birth weights of 1750 grams or less who were admitted to the St. Paul Children's Hospital Newborn Intensive Care Unit between July 1, 1981, and June 30, 1983. Ninety were born in the United-Children's Hospitals Perinatal Center (inborn); 101 were born in hospitals without tertiary care facilities and transferred (outborn). Eighty-eight of 101 outborn patients were born within the seven-county Twin Cities metropolitan area—most within St. Paul. Birth weight, gestational age, and Apgar scores were similar. Although there was no difference in mortality between the groups, respiratory compromise was less common in the inborn patients ($P < 0.01$). Hospital costs were significantly less for inborn patients (inborn mean, $38,964; outborn mean, $49,118; $P < 0.05$). Catastrophic hospital bills were also less common in the inborn patients. Fourteen of 15 patients whose hospital bills exceeded $100,000 were born outside the perinatal center ($P < 0.01$). We conclude that even within an affluent, medically sophisticated metropolitan community, low birth weight neonates should be delivered in tertiary care perinatal centers. Such a policy is medically and fiscally superior to their postnatal transfer.

Tertiary-care perinatal centers specialize in the care of both high-risk mothers and high-risk infants. The development of these centers has prompted a shift from the referral of critically ill neonates to the referral of high-risk pregnant women. The many benefits of such "in utero" transports are said to include decreases in both maternal and neonatal mortality and morbidity,[1-6] decreases in hospital costs,[7-9] and improved maternal-infant attachments.[10,11] However, most centers reporting these findings compared their inborn neonates to neonates transported over long distances.

The Newborn Intensive Care Unit (NICU) of St. Paul Children's Hospital is the neonatal arm of the United-Children's Hospitals Perinatal Center. This NICU receives most of its neonatal transfers from the seven-county Twin Cities metropolitan area, most from hospitals within the inner city of St. Paul. This study examines whether similar benefit occurred in this locally referred population.

Methods

We retrospectively analyzed medical records and inpatient hospital bills for all infants weighing 1750 grams or less, admitted to the St. Paul Children's Hospital NICU between July 1, 1981, and June 30, 1983. Babies who were not viable either because of congenital anomalies or extreme prematurity (<24 weeks' gestational age), infants admitted at >7 days of age, and those transferred to other hospitals were excluded from the analysis. Antenatal, intrapartum, postnatal events and diagnoses were analyzed. In assessing neonatal morbidity, diagnoses (respiratory distress syndrome, apnea, bronchopulmonary dysplasia, etc.) were recorded as present or absent. Statistical analysis of the data was performed using Student's t-tests or Chi square testing where appropriate. Because of the complex interaction of many independent variables, a multivariate, step-wise, multiple linear regression analysis was used to assess the relative importance of each in determining outcome and hospital cost. This technique assigns a relative importance to the individual items and provides an estimate of the variance accounted for in each case. This is expressed as a percentage. Variables that contribute <1% to the total were not considered clinically important.

Results

Of the 191 infants studied, 90 (47.1%) were born in the United-Children's Hospitals Perinatal Center (inborn), 101 (52.9%) infants were transferred from hospitals without tertiary care facilities following birth (outborn). Eighty-eight (87.1%) patients in the outborn group were delivered within the seven-county Twin Cities metropolitan area. Table 1 displays descriptive statistical information for both groups. Table 2 shows the distribution of birth weights for both groups. There were no significant differences. Table 3 shows the incidence of various neonatal

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This work was supported by a grant from the Education and Research Committee of United Hospitals of St. Paul.

TABLE 1

Characteristics of 191 premature infants studied

	Birth Weight (kg)	*Gestational Age (wks)*	*Apgar Score (1 min)*	*Apgar Score (5 min)*
Inborn (n = 90)	1.27 ± 0.29	30.1 ± 3.0	4.3 ± 2.5	6.5 ± 1.9
Outborn (n = 101)	1.27 ± 0.31	28.8 ± 2.9	4.4 ± 2.5	6.3 ± 2.1

TABLE 2

Distribution of birth weights for inborn and outborn infants*

	Weight (gms)				
	<750	*751-1000*	*1001-1250*	*1251-1500*	*1501-1750*
Inborn (%)	3.4	24.4	17.8	30.0	24.4
Outborn (%)	5.0	22.8	17.8	26.7	27.7

*Values shown represent percentages in each weight category.

TABLE 3

Morbidity and mortality in studied patients*

Condition	*Inborn (%)*	*Outborn (%)*
Mortality	15.6	16.8
Respiratory compromise	77.8	92.1**
Apnea of prematurity	70.0	75.2
Bronchopulmonary dysplasia	33.3	32.7
Patent ductus arteriosus requiring surgery	6.7	10.9
Intraventricular hemorrhage	33.3	34.7

*Values represent the percent of affected infants in each group.
**P <0.01

pathologic conditions, morbidities, and mortalities for both groups. Respiratory compromise (hyaline membrane disease, transient tachypnea of the newborn, and aspiration syndrome) was more common in the outborn patients ($P < 0.01$).

Inborn and outborn status was reflected in hospital costs. The average hospital charge for inborn patients was \$38,964 ± \$3,383 SEM. The average hospital charge for the outborn patients was \$49,118 ± \$4,831. The \$10,154 difference in these hospital charges was significant ($P < 0.05$). The average length of stay for the inborn infants was 52.9 ± 3.33 days. The average length of stay for the outborn patients was 58.0 ± 3.67 days. When patients weighing 1500 grams or less were compared, the differences in hospital charges increased. There were 68 inborn and 73 outborn patients in this group. The average charge for inborn babies of 1500 grams or less was \$44,395 ± \$4,037 as compared to \$58,131 ± \$6,259 for outborn patients ($P < 0.05$). Table 4 shows the result of multivariate analysis for the inborn and outborn patients.

Bronchopulmonary dysplasia (defined as persistent requirement for oxygen and/or mechanical ventilation for more than two weeks) was the most important single factor in explaining the variance in hospital charges. Next in importance were sepsis, apnea, and being born outside the perinatal center. Outborn status was associated with overall increases in hospital costs ($P < 0.01$) and in catastrophic hospital bills. Fourteen of the 15 patients whose hospital bills exceeded \$100,000 were outborn ($P < 0.01$).

TABLE 4

Results of multivariate analysis showing the percent of cost variance that can be attributed to the studied variables.

Variable	*Contribution to Cost Variance (%)*
Bronchopulmonary dysplasia	54.7
Sepsis	6.4
Apnea	4.9
Outborn status	1.4
Thrombocytopenia	1.3
Surgery	1.1

Discussion

This study demonstrates a strong association between place of birth and subsequent cost of hospitalization. As others have shown,[7-9] neonates born in hospitals without tertiary care facilities and later transported to tertiary care centers incur higher hospital bills than their inborn counterparts. We have shown that this relationship holds within the Twin Cities metropolitan area where infants are transported only short distances.

Regional perinatal care has produced sharp declines in neonatal mortality and morbidity.[5,7,12,13] In this study, even though mortalities were similar in both inborn and outborn groups, the incidence of respiratory compromise was significantly less in patients who were inborn. This is an important finding since development of bronchopulmonary dysplasia was the single most important factor associated with increased hospital costs. A similar study by Modanlou and co-workers from the Long Beach, California, metropolitan area had similar results.[7]

The incidence of other common neonatal diagnoses and complications were similar between inborn and outborn patients. Although we did not specifically examine severities of illnesses, our cost data imply that outborn babies were more seriously ill as evidenced by their increased cost and longer hospital stays. A recent study from Illinois also found that, despite similar incidences of mortality and morbidity, hospital costs were consistently higher in transported infants.[8] In our study, the infants with the most expensive hospital bills and

TABLE 5

Patients whose hospital bills exceeded $100,000

	Mean ± SD	*Range*
Birth weights	990 ± 199 gms	690-1460 gms
Gestational age	27.2 ± 2.0 wks	25-33 wks
Length of stay	116 ± 40 days	59-182 days
Hospital cost	$145,257 ± $54,221	$100,362 - $264,408

the longest stays were, not surprisingly, very small and immature (Table 5). Of the 14 outborn patients with hospital bills exceeding $100,000, at least eight could have been transported in utero.

Summary

In summary, we compared morbidity, mortality, and hospital cost in similar infants either born in the Perinatal Center of United-Children's Hospitals or transported as neonates from other local institutions. Significantly more respiratory compromise occurred in transported neonates, and their hospital bills were higher. These data support findings from other institutions—that the in utero transfer of low birth weight neonates to tertiary care perinatal center is not only good medicine, it is good business.

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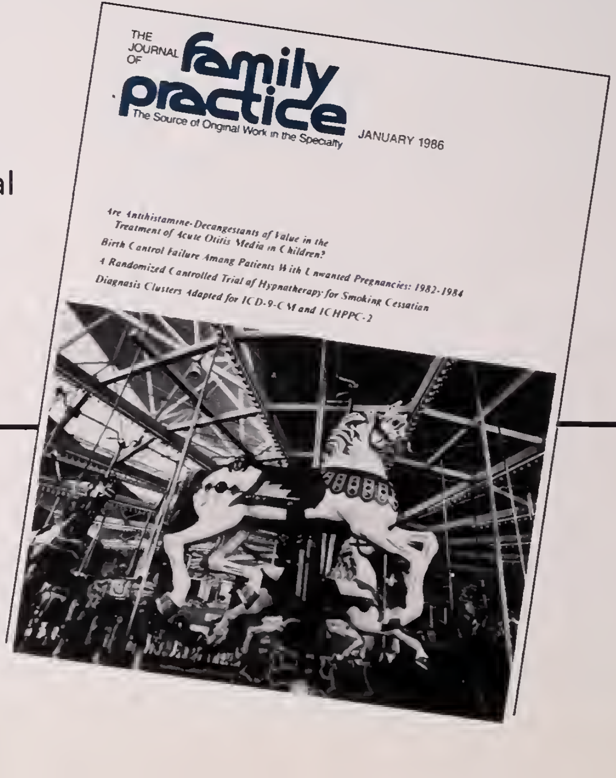

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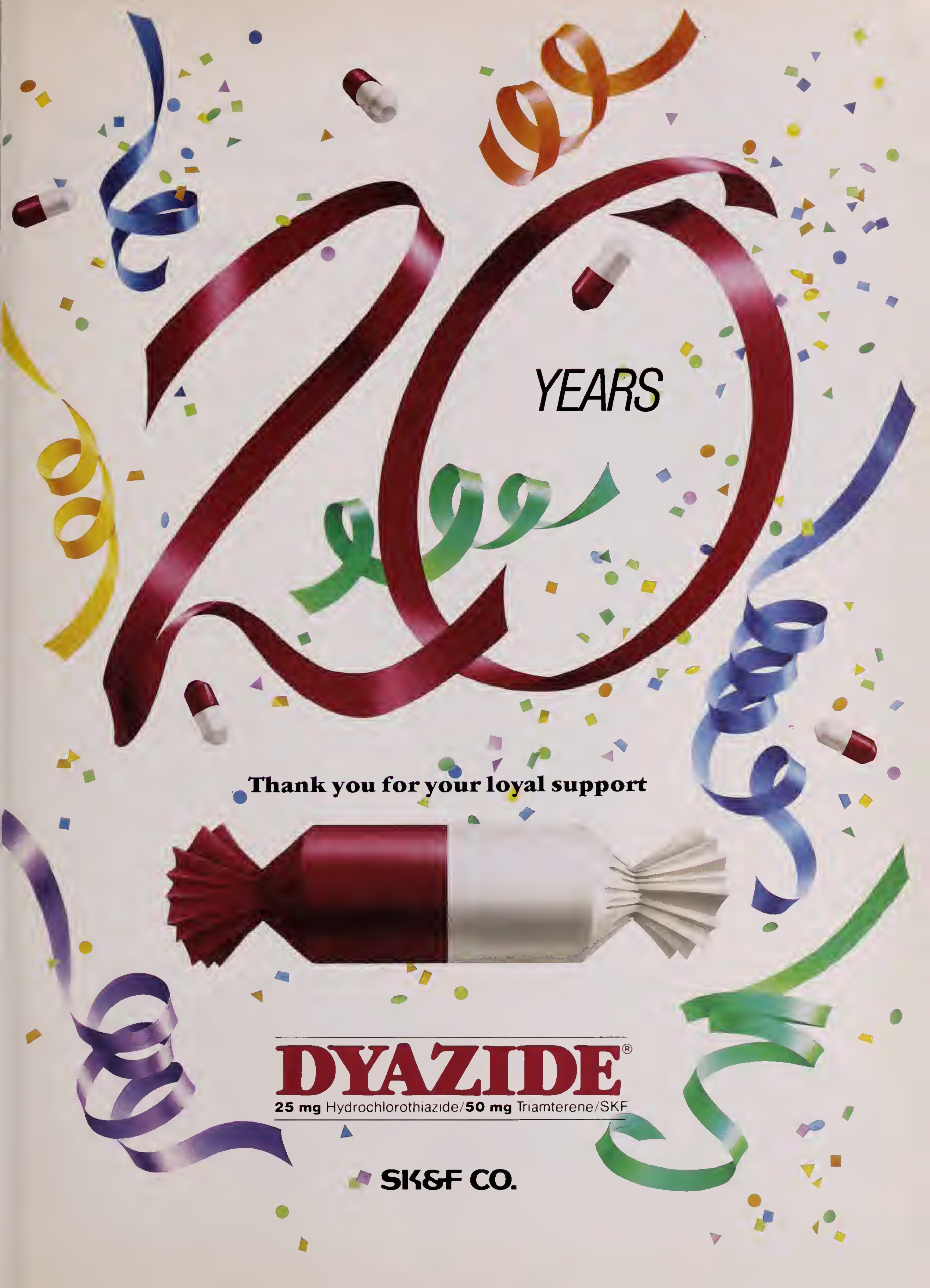

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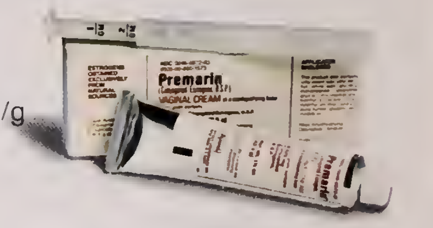

BRIEF SUMMARY *(FOR FULL PRESCRIBING INFORMATION AND PATIENT INFORMATION, SEE PACKAGE CIRCULARS.)*

PREMARIN® Brand of conjugated estrogens tablets, USP
PREMARIN® Brand of conjugated estrogens Vaginal Cream in a nonliquefying base

1. ESTROGENS HAVE BEEN REPORTED TO INCREASE THE RISK OF ENDOMETRIAL CARCINOMA

Three independent case control studies have reported an increased risk of endometrial cancer in postmenopausal women exposed to exogenous estrogens for more than one year. This risk was independent of the other known risk factors for endometrial cancer. These studies are further supported by the finding that incidence rates of endometrial cancer have increased sharply since 1969 in eight different areas of the United States with population-based cancer reporting systems, an increase which may be related to the rapidly expanding use of estrogens during the last decade. The three case control studies reported that the risk of endometrial cancer in estrogen users was about 4.5 to 13.9 times greater than in nonusers. The risk appears to depend on both duration of treatment and on estrogen dose. In view of these findings, when estrogens are used for the treatment of menopausal symptoms, the lowest dose that will control symptoms should be utilized and medication should be discontinued as soon as possible. When prolonged treatment is medically indicated, the patient should be reassessed on at least a semiannual basis to determine the need for continued therapy. Although the evidence must be considered preliminary, one study suggests that cyclic administration of low doses of estrogen may carry less risk than continuous administration; it therefore appears prudent to utilize such a regimen. Close clinical surveillance of all women taking estrogens is important. In all cases of undiagnosed persistent or recurring abnormal vaginal bleeding, adequate diagnostic measures should be undertaken to rule out malignancy. There is no evidence at present that "natural" estrogens are more or less hazardous than "synthetic" estrogens at equiestrogenic doses.

2. ESTROGENS SHOULD NOT BE USED DURING PREGNANCY.

The use of female sex hormones, both estrogens and progestogens, during early pregnancy may seriously damage the offspring. It has been shown that females exposed in utero to diethylstilbestrol, a non-steroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated as not greater than 4 per 1,000 exposures. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have vaginal adenosis, epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether they are precursors of malignancy. Although similar data are not available with the use of other estrogens, it cannot be presumed they would not induce similar changes. Several reports suggest an association between intrauterine exposure to female sex hormones and congenital anomalies, including congenital heart defects and limb reduction defects. One case control study estimated a 4.7-fold increased risk of limb reduction defects in infants exposed in utero to sex hormones (oral contraceptives, hormone withdrawal tests for pregnancy, or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb reduction defects in exposed fetuses is somewhat less than 1 per 1,000. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well controlled studies that progestogens are effective for these uses. If PREMARIN is used during pregnancy, or if the patient becomes pregnant while taking this drug, she should be apprised of the potential risks to the fetus, and the advisability of pregnancy continuation.

DESCRIPTION: PREMARIN (conjugated estrogens, USP) contains a mixture of estrogens, obtained exclusively from natural sources, blended to represent the average composition of material derived from pregnant mares' urine. It contains estrone, equilin, and 17α-dihydroequilin, together with smaller amounts of 17α-estradiol, equilenin, and 17α-dihydroequilenin as salts of their sulfate esters. Tablets are available in 0.3 mg, 0.625 mg, 0.9 mg, 1.25 mg, and 2.5 mg strengths of conjugated estrogens. Cream is available as 0.625 mg conjugated estrogens per gram.

INDICATIONS AND USAGE: PREMARIN (conjugated estrogens tablets, USP): Moderate-to-severe *vasomotor* symptoms associated with the menopause. (There is no evidence that estrogens are effective for nervous symptoms or depression without associated vasomotor symptoms and they should not be used to treat such conditions.) **Osteoporosis (abnormally low bone mass)**. Atrophic vaginitis. Kraurosis vulvae. Female castration.

PREMARIN (conjugated estrogens) Vaginal Cream is indicated in the treatment of atrophic vaginitis and kraurosis vulvae. PREMARIN HAS NOT BEEN SHOWN TO BE EFFECTIVE FOR ANY PURPOSE DURING PREGNANCY AND ITS USE MAY CAUSE SEVERE HARM TO THE FETUS (SEE BOXED WARNING).

Concomitant Progestin Use: The lowest effective dose appropriate for the specific indication should be utilized. Studies of the addition of a progestin for 7 or more days of a cycle of estrogen administration have reported a lowered incidence of endometrial hyperplasia. Morphological and biochemical studies of the endometrium suggest that 10 to 13 days of progestin are needed to provide maximal maturation of the endometrium and to eliminate any hyperplastic changes. Whether this will provide protection from endometrial carcinoma has not been clearly established. There are possible additional risks which may be associated with the inclusion of progestin in estrogen replacement regimens. (See PRECAUTIONS.) The choice of progestin and dosage may be important; product labeling should be reviewed to minimize possible adverse effects.

CONTRAINDICATIONS: Estrogens should not be used in women (or men) with any of the following conditions: 1. Known or suspected cancer of the breast except in appropriately selected patients being treated for metastatic disease. 2. Known or suspected estrogen-dependent neoplasia. 3. Known or suspected pregnancy (See Boxed Warning). 4. Undiagnosed abnormal genital bleeding. 5. Active thrombophlebitis or thromboembolic disorders. 6. A past history of thrombophlebitis, thrombosis, or thromboembolic disorders associated with previous estrogen use (except when used in treatment of breast or prostatic malignancy).

WARNINGS: Long-term continuous administration of natural and synthetic estrogens in certain animal species increases the frequency of carcinomas of the breast, cervix, vagina, and liver. There are now reports that estrogens increase the risk of carcinoma of the endometrium in humans. (See Boxed Warning.) At the present time there is no satisfactory evidence that estrogens given to postmenopausal women increase the risk of cancer of the breast, although a recent study has raised this possibility. There is a need for caution in prescribing estrogens for women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms. A recent study has reported a 2- to 3-fold increase in the risk of surgically confirmed gallbladder disease in women receiving postmenopausal estrogens.

Adverse effects of oral contraceptives may be expected at the larger doses of estrogen used to treat prostatic or breast cancer or postpartum breast engorgement; it has been shown that there is an increased risk of thrombosis in men receiving estrogens for prostatic cancer and women for postpartum breast engorgement. Users of oral contraceptives have an increased risk of diseases, such as thrombophlebitis, pulmonary embolism, stroke, and myocardial infarction. Cases of retinal thrombosis, mesenteric thrombosis, and optic neuritis have been reported in oral contraceptive users. An increased risk of postsurgery thromboembolic complications has also been reported in users of oral contraceptives. If feasible, estrogen should be discontinued at least 4 weeks before surgery of the type associated with an increased risk of thromboembolism, or during periods of prolonged immobilization. Estrogens should not be used in persons with active thrombophlebitis, thromboembolic disorders, or in persons with a history of such disorders in association with estrogen use. They should be used with caution in patients with cerebral vascular or coronary artery disease. Large doses (5 mg conjugated estrogens per day), comparable to those used to treat cancer of the prostate and breast, have been shown to increase the risk of nonfatal myocardial infarction, pulmonary embolism and thrombophlebitis. When doses of this size are used, any of the thromboembolic and thrombotic adverse effects should be considered a clear risk.

Benign hepatic adenomas should be considered in estrogen users having abdominal pain and tenderness, abdominal mass, or hypovolemic shock. Hepatocellular carcinoma has been reported in women taking estrogen-containing oral contraceptives. Increased blood pressure may occur with use of estrogens in the menopause and blood pressure should be monitored with estrogen use. A worsening of glucose tolerance has been observed in patients on estrogen-containing oral contraceptives. For this reason, diabetic patients should be carefully observed. Estrogens may lead to severe hypercalcemia in patients with breast cancer and bone metastases.

PRECAUTIONS: Physical examination and a complete medical and family history should be taken prior to the initiation of any estrogen therapy with special reference to blood pressure, breasts, abdomen, and pelvic organs, and should include a Papanicolaou smear. As a general rule, estrogen should not be prescribed for longer than one year without another physical examination being performed. Conditions influenced by fluid retention such as asthma, epilepsy, migraine, and cardiac or renal dysfunction, require careful observation. Certain patients may develop manifestations of excessive estrogenic stimulation, such as abnormal or excessive uterine bleeding, mastodynia, etc. Prolonged administration of unopposed estrogen therapy has been reported to increase the risk of endometrial hyperplasia in some patients. Oral contraceptives appear to be associated with an increased incidence of mental depression. Patients with a history of depression should be carefully observed. Preexisting uterine leiomyomata may increase in size during estrogen use. The pathologist should be advised of estrogen therapy when relevant specimens are submitted. If jaundice develops in any patient receiving estrogen, the medication should be discontinued while the cause is investigated. Estrogens should be used with care in patients with impaired liver function, renal insufficiency, metabolic bone diseases associated with hypercalcemia, or in young patients in whom bone growth is not complete. If concomitant progestin therapy is used, potential risks may include adverse effects on carbohydrate and lipid metabolism.

The following changes may be expected with larger doses of estrogen:

a. Increased sulfobromophthalein retention.
b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability.
c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by PBI, T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered.
d. Impaired glucose tolerance.
e. Decreased pregnanediol excretion.
f. Reduced response to metyrapone test.
g. Reduced serum folate concentration.
h. Increased serum triglyceride and phospholipid concentration. As a general principle, the administration of any drug to nursing mothers should be done only when clearly necessary since many drugs are excreted in human milk.

ADVERSE REACTIONS: The following have been reported with estrogenic therapy, including oral contraceptives: breakthrough bleeding, spotting, change in menstrual flow, dysmenorrhea; premenstrual-like syndrome; amenorrhea during and after treatment; increase in size of uterine fibromyomata; vaginal candidiasis, change in cervical erosion and in degree of cervical secretion; cystitis-like syndrome; tenderness, enlargement, secretion (of breasts); nausea, vomiting, abdominal cramps, bloating, cholestatic jaundice; chloasma or melasma which may persist when drug is discontinued, erythema multiforme, erythema nodosum; hemorrhagic eruption; loss of scalp hair; hirsutism; steepening of corneal curvature; intolerance to contact lenses; headache, migraine, dizziness, mental depression, chorea; increase or decrease in weight; reduced carbohydrate tolerance; aggravation of porphyria, edema; changes in libido.

ACUTE OVERDOSAGE: May cause nausea, and withdrawal bleeding may occur in females.

DOSAGE AND ADMINISTRATION:

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1. *Given cyclically for short-term use only.* For treatment of moderate to severe *vasomotor* symptoms, atrophic vaginitis, or kraurosis vulvae associated with the menopause (0.3 to 1.25 mg or more daily). The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible. Administration should be cyclic (eg, three weeks on and one week off). Attempts to discontinue or taper medication should be made at three- to six-month intervals.

2. *Given cyclically:* Female castration. Osteoporosis. Female castration—1.25 mg daily, cyclically. Adjust upward or downward according to response of the patient. For maintenance, adjust dosage to lowest level that will provide effective control. Osteoporosis—0.625 mg daily. Administration should be cyclic (eg, three weeks on and one week off).

Patients with an intact uterus should be monitored for signs of endometrial cancer and appropriate measures taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding.

PREMARIN® Brand of conjugated estrogens Vaginal Cream

Given cyclically for short-term use only. For treatment of atrophic vaginitis or kraurosis vulvae.

The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible.

Administration should be cyclic (eg, three weeks on and one week off).

Attempts to discontinue or taper medication should be made at three-to-six month intervals.

Usual dosage range: 2 to 4 g daily, intravaginally, depending on the severity of the condition.

Treated patients with an intact uterus should be monitored closely for signs of endometrial cancer and appropriate diagnostic measures should be taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding.

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Lactic Acidosis B Associated with Solid Tumors

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Lactic acidosis B is a metabolic disorder characterized by an excess of hydrogen ion (pH <7.37) and lactate (serum lactate >2mEq/1) in the absence of tissue hypoxia. This report discusses lactic acidosis B associated with solid tumors. Controversy exists as to whether this entity results primarily from impaired hepatic metabolism of lactate or from autonomous production of lactate by the tumor. Evidence supporting the latter hypothesis includes: a) the rarity of lactic acidosis B in fulminant hepatic failure resultant from agents lacking the ability to independently generate lactate, b) the temporal association between reduction of tumor mass and resolution of acidosis despite persistence of abnormalities of hepatic enzymes, c) occasional cases of tumor-associated lactic acidosis B in the absence of detectable hepatic metastatic disease. Although the estimated one-month mortality rate from solid tumor-associated lactic acidosis B is 80%, this complication can be reversed by effective antineoplastic chemotherapy.

Case Report

A 73-year-old white male was admitted to the Minneapolis Veterans Administration Hospital for evaluation of ventricular arrhythmias. His past medical history was remarkable for recurrent paroxysmal ventricular tachycardia following myocardial infarctions in 1980 and 1981. He had been doing well on quinidine sulfate therapy until four days prior to admission when he suddenly felt weak and summoned paramedics, who found him to be in ventricular tachycardia with a systolic blood pressure of 80 mmHg. He was conscious and regained sinus rhythm following administration of lidocaine and cardioversion (50J, synchronized). His cardiac enzymes were negative. He was started on tocainide, and transferred to the Minneapolis VA Hospital.

The patient had a 20-year cigarette smoking history but had been abstinent since 1952. There was no recent history of alcohol use or exposure to hepatotoxic substances. The systems review was negative for weight loss, hemoptysis, and dyspnea. Physical examination at the time of transfer revealed an obese white male in no distress with a blood pressure of 120/80 mmHg and heart rate of 80 beats/minute and regular. There was no jaundice or clubbing. The pulmonary and cardiovascular exams were entirely normal. The abdomen was soft and nontender with normal bowel sounds. The liver span was percussed at 6 cm. Admission laboratory studies included: hemoglobin 13 g/dl, white blood cell count (WBC) 7300/ml, platelet count 200,000/ml, sodium (Na) 136 mEq/l, potassium (K) 4.1 mEq/l, bicarbonate (HCO_3) 25 mEq/l, blood urea nitrogen (BUN) 16 mg/dl, creatinine (Cr) 1.4 mg/dl, serum aspartate aminotransferase (AST) 91 u/l, alkaline phosphatase 482 u/l, gammaglutamyltransferase (GGT) 156 u/l, prothrombin time (PT) 13.6 seconds, partial thromboplastin time (PTT) 25 seconds, calcium (Ca) 9.2 mg/dl, hepatitis B surface antigen negative, quinidine level therapeutic. The electrocardiogram (EKG) showed sinus rhythm with an old inferior scar. The chest roentenogram (CXR) was normal. The patient underwent cardiac catheterization and electrophysiologic studies due to persistent runs of ventricular tachycardia on tocainide. These studies showed severe three vessel disease with a ventricular ejection fraction of 45%. The patient had readily inducible ventricular tachycardia (multimorphic) with slowing of the rhythm by procainamide.

The patient's liver-associated enzymes, which had been normal one year previously, were noted to be elevated at the time of this admission. The AST, Alkaline phosphatase, and PT progressively rose throughout his hospital course (Table 1). During the second week in the hospital, the patient rapidly developed tender hepatomegaly and jaundice. This progressed despite discontinuation of all medications. On the 27th hospital day (Table 1) the anion gap increased and a compensated lactic acidosis developed. The next day, the patient had an 18 cm liver span and developed disseminated intravascular coagulation. The patient's lactate rose to 10 mEq/l. He remained normotensive and afebrile until his death. All blood and sputum cultures were sterile.

Computed tomography and ultrasound examination of the abdomen revealed changes in the liver compatible with metastatic carcinoma, although a source for the metastasis could not be found. Liver

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TABLE 1
Clinical and laboratory findings in a patient with lactic acidosis B

Hospital Day	*1*	*14*	*19*	*30*	*33*
Laboratory Test Clinical Finding					
AST(u/l)	71	115	146		154
GGT(u/l)	156	343			
Alk Phos(u/l)	522	705	822		1166
Bili(mg/dl)	0.5	1.3	1.6		16
Cr(mg/dl)	1.1				1.1
pH	7.37			<7.37	7.36
Anion Gap(mEq/l)	17			18	19
Lactate(mEq/l)				10	>10
PT(sec)	11.8				21
PaO_2(mmHg)	>90			>90	>90
Liver Span(cm)	6			16	20

biopsy was not possible due to the coagulopathy. The patient deteriorated with progressive lactic acidosis and died on the 33rd hospital day. A postmortem liver biopsy revealed poorly differentiated oat cell carcinoma. CXRs were normal even in retrospect. Permission for a full autopsy was denied.

Discussion

Lactic acidosis B is a metabolic disorder characterized by an excess of hydrogen ion pH <7.37) and lactate (serum lactate >2mEq/l) in the absence of tissue hypoxia.[2] Lactic acidosis is divided into two major groups (A and B) based on the presence (A) or absence (B) of tissue hypoxia.[3] Type B lactic acidosis is subdivided into three categories based on the clinical setting in which the acidosis occurs:[3] 1) B1 - associated with systemic diseases (e.g., neoplasm, diabetes), 2) B2 - associated with drugs or toxins (e.g., methanol, phenformin), 3) B3 - associated with inborn errors of metabolism (e.g., glycogen storage diseases).

Lactic acidosis B1 resulting from neoplasm was first described in association with hematologic malignancies.[4] It has subsequently been associated with solid tumors of the breast, colon, and lung.[1,5-11] The etiology of lactic acidosis B1 associated with solid tumors is complex. It has previously been implied that the condition is predominantly the result of metastatic disease in the liver with attendant impairment of hepatic lactate metabolism.[5] A review of lactate homeostasis, together with evidence from this case (and previously unreported data from an earlier case) suggest that overproduction of lactate by the tumor, rather than impaired hepatic metabolism, best explains this syndrome.

Lactic acid is the end product of the glycolytic pathway. It is a strong metabolic acid that is fully dissociated at physiologic pH. Lactate is the buffered residue of lactic acid. Under hypoxic conditions, cellular metabolism is diverted from the more exergonic tricarboxylic acid (TCA) and oxidative phosphorylation cycles to the glycolytic pathway, thus favoring the production of lactic acid.

The serum lactate level is a result of the balance between the production (physiologic + tumor derived) and elimination (metabolism + renal clearance) of lactate. Normal production of lactate is 20 mM/kg/day.[2] Lactate is produced by many tissues, but the major sources in humans are the erythron (25% daily production), brain, and skeletal muscles.[3] Small, but potentially significant, production of lactate can occur in the platelets, leukocytes, and skin.[3] Metabolism of lactate is also widespread but occurs primarily in the liver (50% of daily consumption) and kidney.[3] The liver can extract 3400mM of lactate from the circulation each day.[2] Under aerobic conditions, two-thirds of the lactate is oxidized to pyruvate and enters the TCA cycle.[11] Additional capacity for lactate metabolism is found in the kidney (35% of daily consumption) and skeletal muscle. The kidney not only metabolizes lactate but clears it into the urine once serum levels exceed 6-10mM.[3] Thus, there exists considerable reserve for elimination of lactate.

The observation that suggested lactic acidosis B associated with malignancy results from "hepatic insufficiency" was the noted prevalence of liver metastasis in this syndrome (some series report rates of 90%).[4,5] The frequency of liver metastases could alternatively be interpreted to suggest the syndrome occurs primarily in patients with a high tumor burden. Thus, if the tumor were capable of generating lactate, hepatic metastases would indicate a large potential to do so. The presence of hepatic metastases alone is certainly not sufficient to cause lactic acidosis as reflected by the rarity of this complication among patients with significant involvement of the liver by tumor.

Additional observations refute the contention that metastatic destruction of the liver underlies this entity. First, there is not only an immense hepatic reserve for lactate metabolism, but, should that be exhausted, there is a large renal and skeletal muscle metabolic capacity that presumably would not be affected by hepatic metastases. In one case, a marked increase in urine acid excretion occurred during a period of severe lactic acidosis B1 associated with oat cell carcinoma.[11] With effective chemotherapy, net urine acid excretion returned to normal levels within 48 hours. The resolution of acidosis and fall in urine acid excretion that occurred despite persistence of abnormal hepatic-associated enzymes is illustrated in Figure 1. This patient had mild but persistent elevation of liver-associated enzymes for the remainder of his life without recrudescence of the acidosis. Normalization of hepatic enzymes and synthetic parameters would precede resolution of the acidosis if hepatic dysfunction were causal. Instead, the lactic acidosis resolved in parallel with the rapid fall in tumor burden as evidenced by a 50% reduction in the liver span and size of the lung mass. Had there been no ectopic source of lactate production in this case, where compensatory renal lactate clearance was demonstrated, it is unlikely serum lactate levels as high as 21 mEq/1 would have been achieved.[11]

The current case report resembles that of Rice and Schwartz in the absence of significant pulmonary symptoms and rapid onset of painful hepatomegaly.[11] Metabolically active tumors with high mitotic rates account for most cases of lactic acidosis B1 associated with solid tumors. This is reflected by the observed frequency of oat cell carcinoma in this composite series (58%) (Table 2). If hepatic dysfunction alone were sufficient to result in lactic acidosis B, one would expect patients with severe hepatitis or cirrhosis to manifest the syndrome; this is not the case. Such patients do occasionally develop mild increases in serum lactate as a result of their chronic respiratory alkaloses. The alkalosis activates phosphofructokinase, thus enhancing glycolysis.[12] This, and the tendency of alkalosis to enhance transport of lactate extracellularly, combine to elevate the serum lactate in patients with cirrhosis without causing acidemia. In a series of 25 patients with fulminant hepatic failure, only one developed lactic acidosis.[13] Finally, reports exist of solid tumor-associated lactic acidosis B1 in patients having no evidence of hepatic matastases.[1]

A contributory role for metastasis-induced hepatic dysfunction cannot be excluded as hepatic lactate production and clearance have not been measured in this condition. Furthermore, there are factors other than metastases that can diminish the liver's ability to metabolize lactate. Severe acidosis (pH< 7.1) or diminished hepatic blood flow promotes the development of lactic acidosis.[12] Severe acidosis can inhibit pyruvate carboxylase and thereby prevent lactate from entering the TCA cycle.[4,12] The combination of these two factors can actually cause the liver to be a net producer of lactate. However, neither severe acidemia nor hypotension was noted in this case or in the case reported by Rice and Schwartz.[11] Assuming excess lactate production by tumor causes this syndrome, how does this occur? Although, by definition, lactic acidosis B1 does not involve generalized hypoxia or hypoperfusion, it is known that tumors may outgrow their blood supply.[14] This is especially apt to occur in rapidly growing solid tumors. Within a tumor an hypoxic micro-environment might exist that could promote tumor cell lactate production.[2,3] In lactic acidosis B1 associated with hematologic malignancy "marrow stagnation" is often invoked as a causal mechanism.[3,14,15] It has been shown that leukemic cells raised in an hypoxic environment are capable of generating lactate.[16,17] Another mechanism by which malignant cells might generate lactate relates to intrinsic genetic differences between malignant and normal cells. Several types of malignant cells have excessive glycolytic pathway activity.[3,16] Even in the absence of hypoxia this could promote excess lactate production, and it would presumably do so in a manner proportional to the tumor burden. Thus, only certain tumors would be able to produce lactate, and these would do so in proportion to the burden of tumor cells metabolically capable of generating lactate. These speculations fit well with the observed epidemiology of tumor-associated lactic acidosis B1.

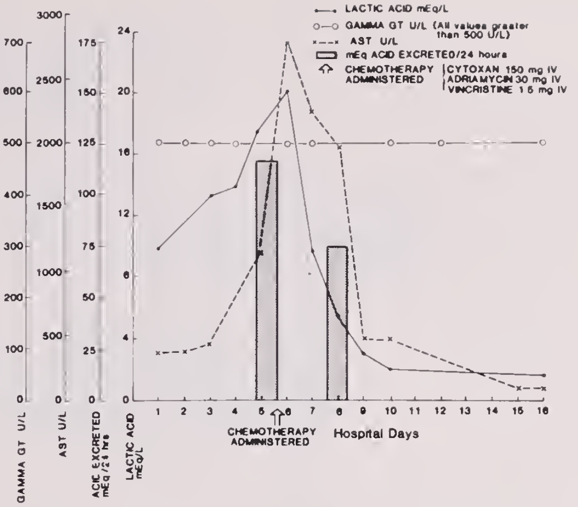

Figure 1 - The effect of chemotherapy on acid excretion and relationship of serum hepatic enzymes to clinical course in a case of lactic acidosis B1.[11]

Therapy and Prognosis

In 75% of patients with lactic acidosis B1 associated with hematologic malignancies who received chemotherapy, the acidosis resolved, demonstrating the potential reversibility of this disorder.[7] In contrast, only four of the twelve previously

TABLE 2
Epidemiology of diagnosis, management, and outcome for solid tumor-associated lactic acidosis B1

Location of tumor	*Lactic acid mEq/1*	*Liver enzymes abnormal*	*Evidence of tumor in liver*	*Chemo-therapy given*	*Lactic acidosis resolved*	*Survival from diagnosis (days)*
lung oat cell (5)**	26.6	+ *	+PM	No	No	1
lung oat cell (5)	25.0	+PM	-	No	No	6
lung oat cell (8)	12.8	+	+B	Yes	Yes	alive at 5 months
lung oat cell (10)	24.0	+	+PM	No	No	9
lung oat cell (9)	4.5	+	+PM	No	No	10
lung oat cell (11)	20.4	+	NA	Yes	Yes	120
lung oat cell (see text)	10.0	+	+PM	No	No	6
lung large cell (1)	12.0	-	-	No	No	30
lung epidermoid (10)	11.3	+	+B	Yes	No	7
colon (13)	15.0	+	+	No	No	NA
breast (6)	15.0	+	+B	Yes	No	NA
breast (7)	13.0	+	+PM	Yes	No	7

+/- denotes presence/absence of abnormality
** Reference number
NA = information unavailable
PM = postmortem examination
B = biopsy examination

reported cases of solid tumor-associated lactic acidosis B1 received any antineoplastic therapy.[1,2,5-11] Two of these four patients had resolution of the acidosis or remission of the tumor.[8,11] Although all twelve of these patients were quite ill at the time of their initial presentation to hospital most had an antemortem diagnosis of cancer, lived at least one week in hospital, and had tumors that were potentially responsive to chemotherapy (Table 2). It seems probable that the high reported mortality rate for this condition (estimated at 80% for 1 month in this composite series) creates a perception of lactic acidosis B1 as untreatable, resulting in a self-fufilling prophecy.

There is no evidence that supportive modalities including oxygen, glucose, or bicarbonate are of more than transient use in solid tumor-associated lactic acidosis B1.[1,18] Reports from animal and human studies have suggested that bicarbonate may actually increase serum lactate levels.[1,18] Doses of sodium bicarbonate as high as 1200mM/day failed to restore normal pH or bicarbonate levels in phenformin-induced lactic acidosis.[18]

Conclusions

In contrast to previous reports, which theorized that lactic acidosis B1 associated with solid tumor resulted from metastases-induced liver dysfunction, this report suggests that overproduction of lactate by the tumor best explains the syndrome. Theories for the mechanism of tumor-induced lactate production include an hypoxic micro-environment within the tumor and/or genetic alteration of the tumor cell which enhances the activity of its glycolytic pathway. The condition is amenable to treatment with antineoplastic chemotherapy, but there are no effective palliative agents nor any reports of spontaneous resolution.

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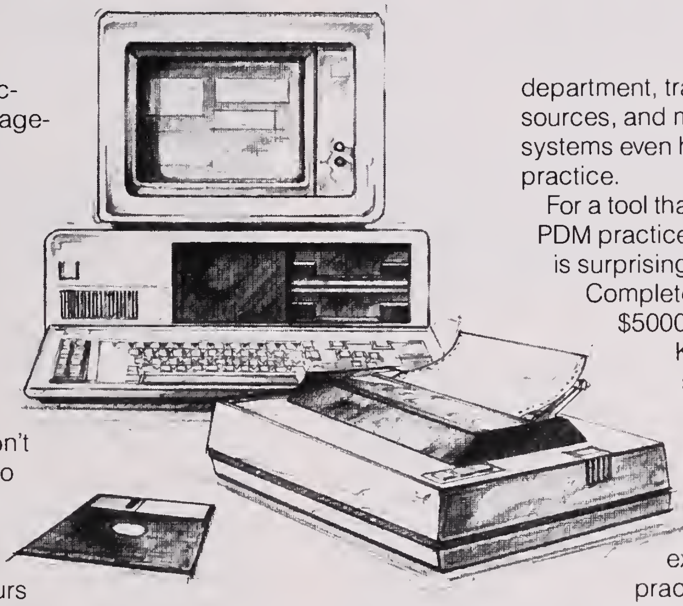

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Temporomandibular Joint: Diagnosis of Internal Derangements Using Magnetic Resonance Imaging

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A series of 105 patients with the clinical diagnosis of temporomandibular joint (TMJ) pain-dysfunction syndrome were evaluated using magnetic resonance imaging (MRI) with a surface coil. MRI provided detailed information regarding meniscus morphology and position in most cases. The noninvasive and multiplanar characteristics of MRI establish it as the most promising modality for the diagnosis of TMJ internal derangements.

Internal derangements of the temporomandibular joint (TMJ) represent a common affliction that is often confusing for the clinical practitioner. Up to 28% of the adult population under age 40 may suffer from TMJ abnormalities according to random surveys.[1] Significant degenerative meniscus alterations approach 70% in postmortem specimens obtained from persons over 65 years of age.[2] In light of the prevalence of this disorder, a basic understanding of the pathophysiology of TMJ internal derangements and the diagnostic modalities available for patient evaluation is important for the clinician. The objective of this paper is to introduce MRI as a useful, noninvasive method of patient examination. Comparison with tomography and arthrography is provided. Recommendations regarding cost-effective use of available imaging techniques are offered.

Methods

A total of 180 TM joints in 105 patients (aged 14-57) with clinically diagnosed TMJ internal derangements were examined. Clinical symptoms included pain, crepitus, clicking, and limitation of motion. Fifty-two of the patients manifested a closed lock and had restricted condylar movement on preliminary lateral TMJ tomograms. Nine patients had undergone prior arthrography with videotaped arthrofluoroscopy. Surgical correlation has been available in 24 joints to date.

MRI was performed on a General Electric 1.5 Tesla Signa MR system using 13 cm (24 patients) and 6.5 cm-diameter (81 patients) surface coils as receivers. Contiguous 3 mm-thick sagittal images were obtained using TR internals of 500-1000 msec and either partial saturation or spin-echo sequences with a TE of 20-25 msec, 256 × 256 matrix, and two averages. (A fairly standard method of examination was adopted after approximately 40 patients, employing a 6.5 cm surface coil and partial saturation technique with TR of 600 msec and TE of 20 msec.) Scan times for the closed-jaw examinations were 8 min, 36 sec and 5 min, 7 sec for the 13 cm and 6.5 cm surface coils, respectively. Patients were carefully positioned with respect to the condylar orientation noted on preliminary base projections performed with the TMJ tomograms, when available. Open jaw images (85 patients) were performed using a shorter scan time. Fourteen of the joints imaged were considered technical failures because of poor resolution usually attributable to patient motion. Three patients insisted on terminating the study because of claustrophobia. Two patients could not be examined because of ferromagnetic dental braces that interfered with the magnetic field. The average examination required approximately 30 minutes to evaluate both joints in closed-jaw position. A complete examination of both joints in closed and open-jaw position required an average of 50 minutes.

Discussion

Normal and abnormal joints can be clearly defined using MR and surface coils. In the normal joint, a sharp demarcation is seen between the posterior band of the meniscus and the posterior attachment (bilaminar zone) (Figures 1 and 2). The meniscus exhibits a biconcave appearance with some flexibility noted when closed and open jaw images are compared.[7-9] The cortical bone of the articular surfaces of the condyle, glenoid fossa, and eminence provide no signal and contrast with the fat within the marrow of the condyle and temporal bone (Figures 1 and 2). The superior and inferior bellies of the lateral pterygoid muscles are sharply defined on medial images due to the high signal intensity of adjacent fat.

A chronically displaced meniscus may appear thickened and deformed with upward buckling

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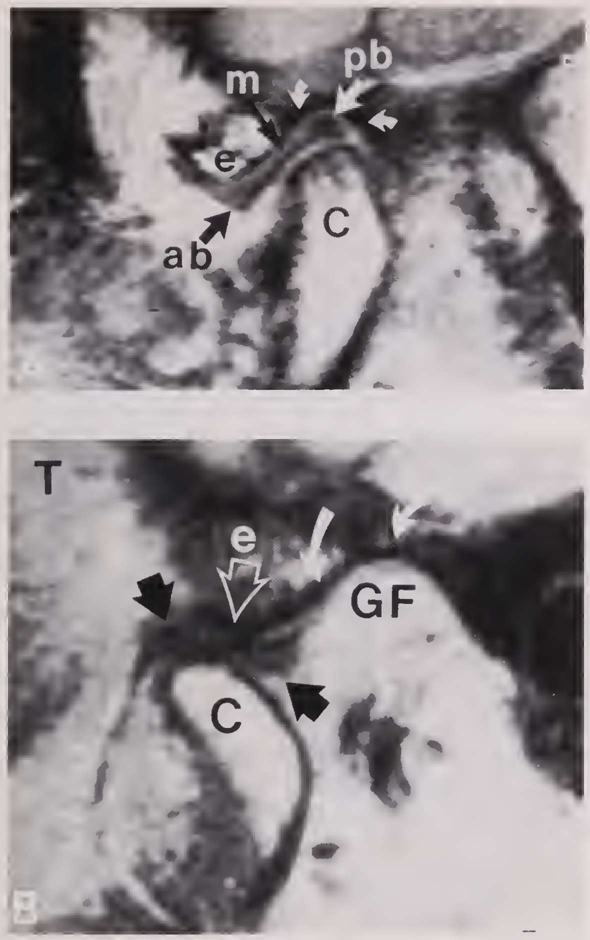
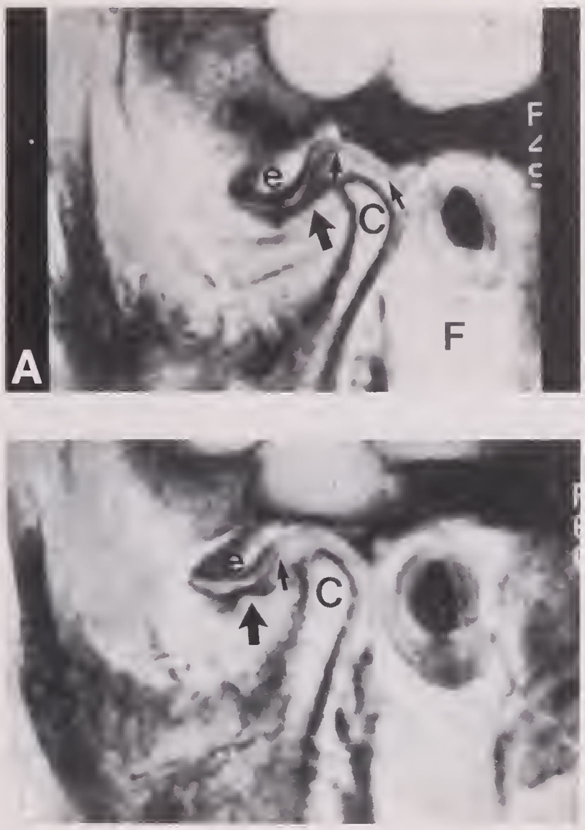


Figures 1A and B - Normal TMJ in closed (A) and open-mouth (B) positions. **A.** The meniscus (m and arrow) lies between the articular surface of the mandibular condyle (C) and the cortical surface of the glenoid fossa of the temporal bone (curved arrows). The articular eminence (e) of the temporal bone marks the anterior boundary of the glenoid fossa. The anterior band (ab) and posterior band (pb) of the meniscus appear as areas of relative thickening compared to the central articular zone, which exhibits a gentle concavity where it articulates with the condyle. Note the high signal intensity (white areas) within the bone marrow of the mandibular condyle. Other areas of high signal intensity represent fat within the soft tissues. **B.** After forward translation, the condyle has moved beyond the articular eminence. The meniscus (arrow heads) lies between the condyle and the articular eminence above. Note the nearly absent signal from the smooth cortical bone (curved arrows) of the glenoid fossa (GF). The temporalis muscle (T) is viewed above and anterior to the condyle.

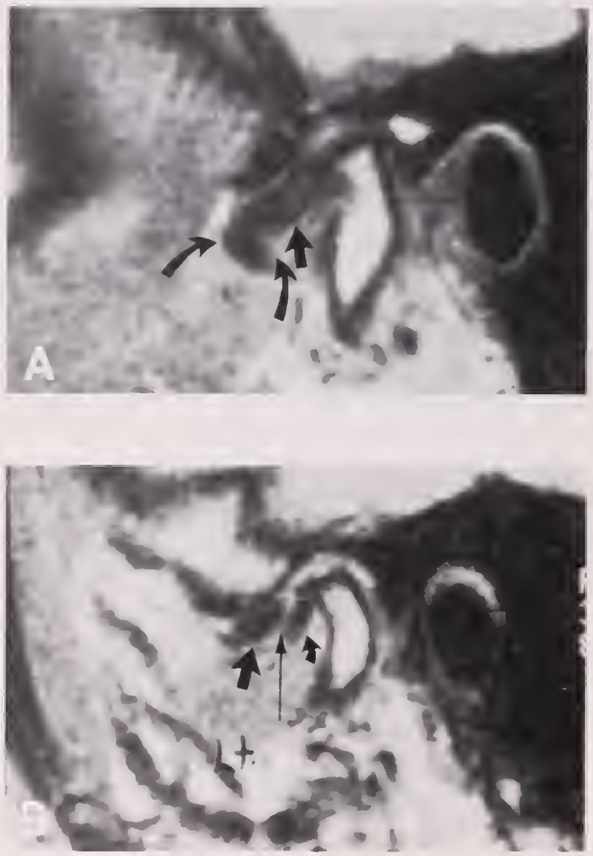


Figures 2A and B - Abnormal TMJs showing intermediate-stage (A) and late-stage (B) internal derangements. **A.** The TMJ meniscus (large arrow) is anteriorly displaced relative to the mandibular condyle (C). The bilaminar zone or posterior meniscus attachment (small arrows) is grossly stretched in this case. Note the reversed concavity of the meniscus as it lies against the articular surface of the eminence (e) of the temporal bone. Note the high signal emanating from subcutaneous fat (F) below and posterior to the neck of the mandibular condyle. **B.** The meniscus (large arrow) is grossly atrophic, deformed, and severely displaced relative to its normal position (compared with Figure 1A). Note the extreme stretching of the posterior meniscus attachment (small arrow). (Figures 2A and B also appear in CDI Consult, August, 1986.)

(Figure 3A). Perforation of a thickened, displaced meniscus may be clearly visible (Figure 3B). Degenerative alterations in the pterygoid muscles and anterior meniscus attachment may be identified. The posterior band of the meniscus and bilaminar zone are usually distinguishable (Figure 2). Precise medial versus lateral positioning can be determined from the sagittal views or can be defined by employing coronal or axial images. Surgical implants can be imaged with MR (Figure 4). Inflammatory changes and joint fluid can be imaged with spin-echo sequences employing longer TR intervals and echo delays than are routinely used.[8] MRI with tomography is highly useful in evaluating the symptomatic or restricted post-meniscectomy TMJ. Degenerative bony changes may be visualized but are better displayed with standard tomograms or CT.[4,5] We have observed significant discrepancies in bony anatomy when comparing conventional tomography and MRI; therefore, screening tomograms are considered valuable in most cases.

Conclusion

MRI is a powerful diagnostic tool that will replace TMJ arthrography in most cases. Our experience with the closed-lock patients establishes MRI as the examination of choice in this condition. The lack of ionizing radiation, multiplanar imaging capability, and noninvasive characteristics of MRI represent a tremendous advantage over arthrography, which is invasive and requires considerable skill and experience to perform successfully.



Figures 3A and B - Chronic degenerative meniscus alterations observed in late-stage internal derangements. (A and B were obtained from the right and left joints respectively from a 44-year-old female with a ten-year history of TMJ symptoms). **A.** Chronic meniscus subluxation resulting in a closed-lock clinical presentation. The thickened and deformed meniscus (arrow) exhibits buckling anteriorly (curved arrows) due to laxity within the anterior attachment. The posterior attachment was perforated and stretched at surgery. **B.** Surgically-proven meniscus perforation. The deformed meniscus (large arrow) lies anterior to a free perforation (long thin arrow) between the insertion of the torn posterior meniscus attachment (small curved arrow) and the posterior band of the deformed meniscus. (Figures 3A and B appear in chapter entitled, "Magnetic Resonance Imaging of the Temporomandibular Joint," by Kurt P. Schellhas, M.D. In: TMJ and Craniofacial Pain, Diagnosis and Management. JR Friction (ed). Ischiyaku EuroAmerica, Inc., 1986. All cases used with permission of author and publisher.)

In light of the available technology, the choice of imaging methods may be difficult for practitioners seeing patients with TMJ symptoms. Standard lateral TMJ tomograms in closed and open position remain the cornerstone of radiologic evaluation.

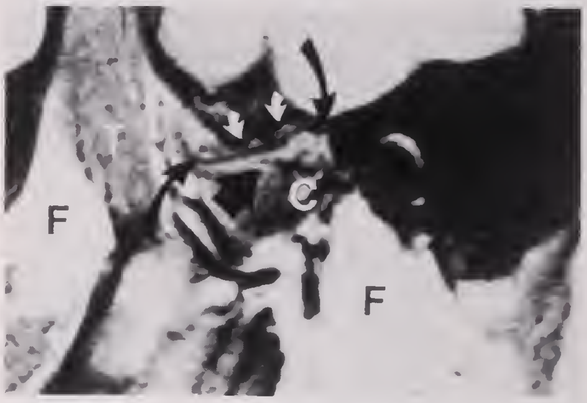


Figure 4 - Severe joint destruction by granulation tissue associated with a proplast joint implant. The meniscus prosthesis (large curved arrows) exhibits diminished signal relative to the extremely vascular granulation tissue (large arrowhead) which was encountered during surgical removal of the prosthesis. The mandibular condyle (C) is severely deformed and eroded by the granulation tissue, which is also growing into the deformed articular surface of the glenoid fossa and eminence (small curved arrows). Note the abundant subcutaneous fat (F) providing sharp contrast between various soft tissue structures in the malar region. The medial aspect of the temporalis muscle (T) is seen near its insertion along the medial surface of the mandible.

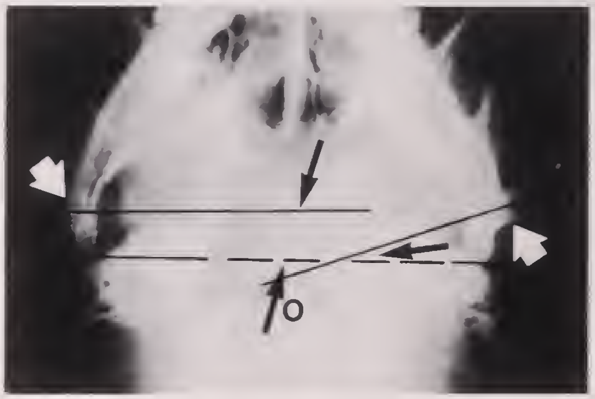


Figure 5 - Submentovertex (base) projection of the mandibular condyles showing asymmetric condylar orientation as a predisposing factor to internal derangement of the joint. The mandibular condyles (large arrowheads) exhibit a 20° discrepancy in orientation relative to a line drawn through the external auditory canals (broken line). Normally, an angle of approximately 15-20° is made relative to this reference line. In a true base projection, the lines through the condyles will intercept the skull base near the odontoid process (O), as on the left side of this case. Note the coronal orientation of the right condyle. This information is also used during positioning of the patient for lateral TMJ tomograms and MRI.

Submentovertex (base) and posterior-anterior (PA) views of the condyles provide an important reference for patient positioning for the lateral tomograms and MRI (Figure 5). If tomograms reveal bony alterations such as sclerosis, spur formation, and flattening of the eminence or condyle, advanced internal derangement can be inferred.[2,10] If tomograms and base view appear normal in a patient with suspected internal derangement, either arthrography or MRI imaging may be indicated. It is our opinion that patients manifesting a closed lock or restricted motion can be adequately evaluated with MRI. Anterior displacement of the meniscus is easily demonstrated with MRI, and arthrography is difficult in patients with severely restricted motion (Table 1). Videofluoroscopy, performed during arthrography, provides valuable information regarding functional joint dynamics in patients with normal range of motion, so the choice of imaging method should be considered individually in these cases (Table 1). Patients manifesting atypical myofascial pain in the face, malar region, and jaw may benefit from MRI. Direct communication between the referring clinician and MRI imager is crucial in specialized examinations of this type.

TABLE 1

Comparison of TMJ Arthrography and Magnetic Resonance

	Arthrography	*Magnetic Resonance*
Advantages	Functional joint dynamics observed line of fluoroscopy and recorded on videotape. Failure to obtain diagnostic examination rare (1%) with skilled and experienced arthrographer.	NONINVASIVE NO RADIATION Superior contrast resolution with ability to view soft tissue in multiple planes.
Disadvantages	INVASIVE (Wide variation in techniques and patient discomfort.) RADIATION (Varies with time of procedure, number of exposures, and collimation.) Examination difficult on obese patients and persons with severe limitation of condylar motion (closed lock).	Ineligible patients (dental braces and other ferromagnetic appliances; claustrophia). Technical failures more likely (currently 5-8%), (motion most common cause). (Current limitations in spacial resolution will improve.)

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Resources for Persons with AIDS and Related Illnesses

MARGARET L. SIMPSON, M.D.[*], and the MMA TASK FORCE ON AIDS[†]

Growing numbers of people belonging to high-risk groups are seeking information about the AIDS virus. A brief overview of facilities and services available to people infected with the AIDS virus or those desiring information about AIDS is presented here. Included are discussions of the alternate test sites (or testing and counseling sites), services offered by the Minnesota AIDS Project, the activities of state and county community health departments, and the future long-term care that will be needed for those infected with the AIDS virus.

During the spring of 1985, blood banks in the United States started screening all donated units of blood for antibody to HIV (the human immunodeficiency virus—AIDS virus). To prevent persons in high-risk groups from donating blood in order to ascertain their antibody status, alternate test sites (now identified as testing and counseling sites)[1] were established. In Minnesota, two alternate test sites were established in the Twin Cities in August 1985. Since then, three other sites have been established in Minnesota. Table 1 gives more information about the testing and counseling sites operating in this state.

The protocol followed for testing at each site is very similar. If possible, individuals should make an appointment before going to the facility to be tested. At some time during the registration process, the person's name will be requested. However, the test will still be performed if the individual chooses not to give a name. Following registration, a clinician trained in HIV counseling discusses with the individual what activities have placed him or her at risk for AIDS virus infection. The clinician also reviews some symptoms that may be caused by HIV infection, primarily to educate the individual about symptoms he or she should be watching for. In addition, the individual is counseled on the prevention of transmission and acquisition of the virus.[2] This may be done before the blood is drawn and after the test result is known because the suggestions are essentially the same for persons in high-risk groups whether or not they are infected with the virus. Safe sex is reviewed in detail and high-risk activities specifically mentioned. Essentially, safe sex requires that there be no exchange of body secretions—no semen in the rectum, mouth, or vagina. The use of condoms, reduction of the number of sex partners, and the dangers of sharing intravenous needles are also reviewed during counseling. Members of groups at high risk for HIV infection have been asked to voluntarily refrain from donating blood, semen, or tissue/organs. Following the counseling session and after the blood is drawn, the individual is asked to return in one to two weeks for the test results.

All seroreactive tests have two positive ELISA antibody tests and a positive Western blot antibody test before the individual is informed of the results. At the return visit, the result of the test and its significance are reviewed, and the individual is again counseled about precautions. Persons who are found to be seroreactive receive more specific counseling. Women who are seroreactive are informed that if they become pregnant there is significant risk of the baby being infected. All seroreactive persons are asked to inform their health care providers (including dentists), in order to make the provider aware of any malignancies or opportunistic infections that may occur and, of

TABLE 1

Testing and Counseling Sites in Minnesota

St. Paul Health Department
Room 111
555 Cedar Street
St. Paul, MN 55101
(612) 292-7752

Red Door Clinic
Hennepin County Community Health Department
527 Park Avenue South
Minneapolis, MN 55415
(612) 347-3302

Duluth Community Health Center
2 East 15th Street
Duluth, MN 55805
(218) 722-1497

Olmstead County Health Department
415 4th Street
Rochester, MN 55901
(507) 285-8370

The Quiet Care Clinic
Stearns County Community Health Services
510 25th Avenue North
St. Cloud, MN 56302
(612) 255-6155

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[*] Assistant Professor, Hennepin County Medical Center, University of Minnesota.

[†] Members include: Kent Crossley, M.D., St. Paul (chairperson); Mike Daly, M.D., Minneapolis; Mark Eckman, M.D., Duluth; Robert Gruninger, M.D., Minneapolis (co-chairperson); Brooks Jackson, M.D., Minneapolis; Warren Regelmann, M.D., Minneapolis; Hanan Rosenstein, M.D., Minneapolis; Scott Strickland, M.D., Minneapolis; David Williams, M.D., Minneapolis; and Margaret Simpson, M.D., Minneapolis. Valentine O'Malley, M.D., and Michael Osterholm, Ph.D., M.P.H., are ex officio members

course, to help control the spread of infection. A person who is seroreactive is reminded to follow the counseling guidelines for two reasons. First, to prevent transmission of the AIDS virus. And second, to prevent the individual from being repeatedly exposed to the AIDS virus and other sexually transmitted diseases.[3] A physical examination by a physician is suggested for persons who are seropositive. Because individuals may feel overwhelmed by the information, test site staff make an effort to assess the person's emotional response to the reactive test result to see if he or she needs immediate psychological counseling.

A new public health policy of voluntary contact notification/voluntary partners referral for HIV has been developed by the Minnesota Department of Health.[4] Each person who is found to be seroreactive will be asked to notify or identify recent sexual contacts with whom high-risk sexual activity has been performed or with whom parenteral needles have been shared. Attempts will then be made by the client or a third party to notify these contacts in order to provide education and offer confidential antibody testing.

Clinical Application of HIV Antibody Testing

What is the clinical application of the HIV antibody test? The Centers for Disease Control (CDC) advocates the testing of all members of high-risk groups primarily for public health reasons.[2] High-risk groups include men who have sex with other men, intravenous drug users, and sexual contacts of these two groups. Hemophiliacs may also be considered at high risk for HIV infection. It is hoped that those who are known to be infected with the AIDS virus will follow the counseling suggested in order to prevent transmission of this virus. Although AIDS remains a clinical diagnosis of specific opportunistic infections or malignancies, the CDC suggests that an HIV antibody test be performed for supporting data. In certain specific AIDS diagnoses a seroreactive HIV antibody is necessary before the AIDS diagnosis is confirmed. Other clinical indications for antibody testing may include persons in high-risk groups with symptoms such as fatigue, fever, headache, diarrhea, lymphadenopathy, or an abnormal white count or platelet count.[5] However, it must be kept in mind that not all symptoms in a person who belongs to a high-risk group will be due to HIV infection; other illnesses may cause some of these same symptoms. Whenever the HIV antibody test is performed, it should be discussed with the patient, and all high-risk clients should be counseled about safe sex and virus transmission.

State and Community Health Departments

In addition to providing assistance with the counseling and testing sites, the Minnesota Department of Health has been very active in developing public health activities aimed at limiting the transmission of HIV. The state health department maintains statistics on all AIDS cases in the state and provides speakers to a variety of groups. (For further information regarding Department of Health policies, see the August 1986 issue of Minnesota Medicine.[4]) The county and community health departments are cooperating with the Minnesota Department of Health in providing the testing and counseling sites and many are offering educational programs to a variety of groups. In the Twin Cities, where most of the AIDS patients receive care, the Hennepin and Ramsey county health departments have been active in formulating county policies for persons with AIDS and AIDS virus illnesses. A non-discriminatory policy regarding AIDS has been formulated and adopted by some cities and counties.

Minnesota AIDS Project

Since its establishment in 1983, the Minnesota AIDS Project has become a major resource for education about AIDS and related illnesses. During this time, the AIDS Project has also developed a variety of support services for people with AIDS as well as those infected with the AIDS virus. Professional speakers are available through the AIDS Project and will make presentations tailored to the particular needs of any group. Other Project efforts include explicit safe sex education and safe sex support groups for members of high-risk groups. Educating the general public about AIDS is also an AIDS Project priority. To assist with community and high-risk group education, the AIDS Project is also developing a media campaign. The Twin Cities-based Project is also establishing a Minnesota AIDS Project Representative Program in 26 communities throughout the state. These representatives will distribute educational materials and establish referral services within local communities. A telephone counseling and referral service was also recently implemented at the Minnesota AIDS Project.

Support services provided by the Minnesota AIDS Project continue to expand. Support groups for persons with AIDS, AIDS-related complex, or persons infected with the AIDS virus continue on an on-going basis. Other support groups exist for family, friends, and lovers of persons with AIDS or related illnesses and a newer support group was established for women involved in prostitution. The "buddy" support system for persons with AIDS or

AIDS-related complex remains very active. Buddies are volunteers who have received training and provide peer counseling and support to persons who are ill from AIDS virus infection. The AIDS Project is beginning to use a case management system for AIDS victims who receive Project support and is coordinating housing and providing transportation and other types of non-medical services as needed.

The Minnesota AIDS Project may be contacted at (612) 870-7773, and appropriate referrals will be made. The address for the Minnesota AIDS Project is 2025 Nicollet Avenue South, Suite 200, Minneapolis, Minnesota 55404. Recently, the AIDS Project established a hotline, (612) 870-0700, which operates from 10 a.m. to 10 p.m. Monday through Thursday and 10 a.m. to 5 p.m. Friday. Another state-funded hotline is operating toll free: (800) 752-4281. Anyone with questions or concerns about AIDS may contact one of these hotlines.

Chronic Care Alternatives

Another area of major concern is the long-term care needed by patients with AIDS and related illnesses. Increasingly, clinicians have realized that these patients need to be provided with all available support services so they can be treated in their homes for as long as possible, as is done in San Francisco's Hospice Program. Fortunately, Minnesota has a very active visiting nurse program—a program that will need to be increasingly used along with other non-medical resources. For persons who are no longer able to stay in their homes, long-term care facilities will be needed, and some additional adjustments may be necessary with the increasing number of AIDS cases in Minnesota. The Minnesota AIDS Project and many interested community organizations and physicians are continuing to assess these needs.

Minnesota Medical Association

The Minnesota Medical Association (MMA) has been providing education to Minnesota physicians as well as supporting many of the other educational efforts in the state and is currently developing a pamphlet on AIDS that will be available to the public. For referral to physicians participating in the care of patients with AIDS and related illnesses, contact Eugenia Kassar or Josie Siegrist at the MMA office (612) 378-1875 or (800) 843-6562, ext. 215.

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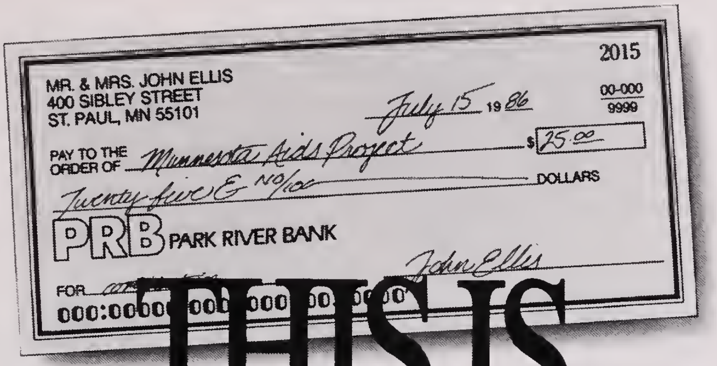

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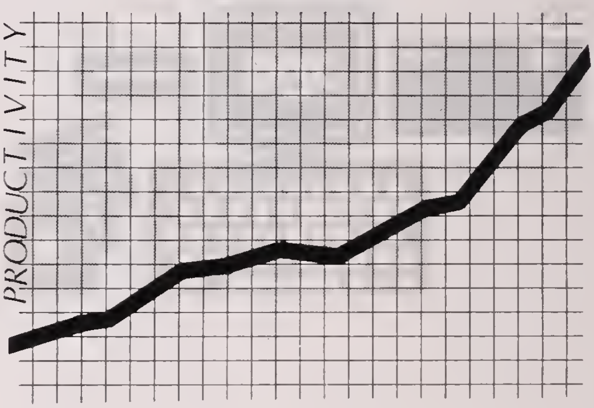

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Rheumatology Corner

Adult Still's Disease Presenting with Fever and a Pruritic Rash

KEITH HENRY, M.D.*

A patient presented with an intensely pruritic rash, arthralgias, and a high fever. Adult Still's disease was diagnosed, and the patient responded to corticosteroid treatment. The rash had features typical of Still's disease except for the pruritis. A review of the English literature found only seven cases of pruritis in Still's disease. Clinicians should be aware that a pruritic rash can be seen in association with adult Still's disease.

Still's disease is an uncommon cause of fever in adults. The term "Still's disease" is often used interchangeably with the systemic form of juvenile rheumatoid arthritis. The adult form of Still's disease (ASD) connotes a distinct systemic syndrome of seronegative rheumatoid arthritis. The "classical" triad often found in Still's disease consists of fever, rash, and arthritis.

The unusual rash seen in Still's disease is perhaps the most helpful finding for making the diagnosis. Standard textbooks[1] and review articles[2] emphasize that the rash is very rarely pruritic. A patient was recently evaluated for high fevers and an intensely pruritic rash believed to be due to Still's disease.

Case Report

A 39-year-old female was referred from an outside hospital for evaluation of a 17-day history of arthralgias, rash, anemia, and fever. She was in her usual state of good health until 16 days prior to admission when she noted a red, itching rash on her legs and knees, which later spread to her trunk. Soon afterward, she noted arthralgias in both wrists, ankles, and shoulders. She became fatigued, and the rash worsened. Her local physician found a hemoglobin of 10 gm% and treated her with oral iron and indomethacin. She was admitted to the outside hospital when she developed fever to 40.5°C. Evaluation revealed a negative rheumatoid factor, negative antinuclear antigen, six sets of negative blood cultures, and an elevated erythrocyte sedimentation rate. She was started on broad-spectrum antibiotics and was transferred to St. Paul-Ramsey Medical Center when no improvement was seen over the next 36 hours. The history obtained on admission was unrevealing. She denied any arthropod or animal exposure and had no prior history of arthritis, fevers, or rashes. Physical examination revealed an oral temperature of 39.7°C with shaking chills. A 1 × 1 cm nontender left posterior cervical lymph node was palpated. She had unremarkable cardiac, pulmonary, and abdominal examinations except for a palpable spleen felt 3-4 cm below the left costal margin. Musculoskeletal examination showed mild synovial thickening and erythema of the left wrist, right ankle, and right knee with a small effusion of the right knee. There was a red, macular, excoriated rash on the knees with macules 2-8 mm in size. The rash was pruritic, more erythematous with fever spikes, and more confluent over thighs, buttocks, calves, and trunk. The rash also was more prominent along pressure lines or where the skin was traumatized (the Koebner phenomenon).

Initial laboratory studies included a hemoglobin of 9.5 gm% (normal 13.5-16.5 gm%), hematocrit 29.1% (normal 39.6-47%), MCV 75 u^3 (normal 83-94 u^3) and a reticulocyte count of .1% (normal .5-2%). Her total white cell count was 10,600/mm^3 (normal 4500-10000/mm^3) with 7000 band forms/mm^3 (normal 150-1700/mm^3) and 2400 adult neutrophils/mm^3 (normal 400-5000/mm^3). The platelet count was 274,000/mm^3 (normal 150-300,000/mm^3). The erythrocyte sedimentation rate (ESR) was 117 mm/hr (normal 0-20 mm/hr, Westergren Method). Serum electrolytes were normal and the serum creatinine was 0.8 mg% (normal 0.7-1.5 mg%). Enzyme analysis included alkaline phosphatase 215 U/L (normal 30-115 U/L), serum glutamic oxalacetic transaminase 65 U/L (normal 0-41 U/L), and lactic dehydrogenase >600 U/L (normal 60-200 U/L).

After initial evaluation, she was started on hydroxyzine HCl and cortisteroid creams for her pruritic rash. Additional blood cultures were negative and her urinalysis was normal. She had a negative anti-DNA antibody, normal complement levels, negative Monospot, negative hepatitis A and B serologies, and a normal serum electrophoresis. She was started on high dose aspirin, which did decrease the fever and arthralgias. The impression of the rheumatology and infectious disease consultants was that she had adult Still's disease. She was discharged on enteric-coated aspirin, tolmetin, and iron supplements. She was also given oral tetracycline until her anti-Borrelia antibody (Lyme serology) returned negative.

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She was readmitted 10 days later for a worsening pruritic rash and fevers to 40.5°C. She was noted at the outside hospital to have a Hg of 7.5 gm% and suffered a transfusion reaction which prompted transfer back to St. Paul-Ramsey Medical Center. Physical exam was similar to that at the time of her prior admission except the left posterior lymph node was 2 × 3 cm in size. She underwent a biopsy of her bone marrow and cervical lymph node and was then started on prednisone, 20 mg q.i.d., when no evidence of an infectious or malignant process was noted in those specimens. Her ESR on this admission was 120 mm/hr and she was found to be direct Coombs' positive with multiple antibodies making crossmatching difficult. Within two days of starting prednisone, her fevers, rash, and arthralgias abated, and she was able to have an uneventful blood transfusion. She was soon discharged and is doing well on follow-up visits and on decreasing doses of prednisone. The discharge diagnosis was adult onset Still's disease.

Discussion

The clinical syndrome now known as Still's disease was first well described by George Still in 1897. In that paper, 12 of the 22 children described had a syndrome compatible with juvenile rheumatoid arthritis. Curiously, Still did not refer to skin rashes in his paper. Eric Bywaters is credited for first using the term adult Still's disease and for publishing the first report on it.[5] A rash is present in 90% of patients described in the English literature.[6]

The rash is typically a fleeting salmon-colored, measles-like macular eruption that appears on the face, trunk, and extremities. It is often most prominent along pressure lines and exhibits Koebner's phenomenon (rash intensified by rubbing or mild trauma). Both the fever and rash are often maximal in late afternoon and accompanied by malaise and headache. The fever often follows a quotidian or double quotidian pattern and often is >40°C.[7] Often ASD is initially misdiagnosed and presents as a fever of unknown origin.[8,9]

The patient presented here had the classic triad of high fever, rash, and arthritis. The intensely pruritic nature of her rash somewhat dissuaded the diagnosis of ASD. A review of papers on Still's disease in the English literature found only seven cases where a pruritic rash was noted. Six[10,11] were in cases of juvenile rheumatoid arthritis. The other case[6] was in a report on ASD and was not well documented; the report simply described the rash in one patient as mildly pruritic. Although many rheumatologists are aware that the rash in Still's disease may be pruritic, that feature is not widely appreciated by most primary care physicians.

The diagnosis of ASD is made on clinical grounds and often other etiologies for the patient's illness have to be considered even when the presentation is typical. The high fever and systemic toxicity suggest an infectious process or vasculitis. The case presented here is believed to be ASD accompanied by a well-documented pruritic rash. The features of the case were otherwise consistent with ASD. This report is intended to alert clinicians to the fact that a pruritic rash can be seen in ASD and should not deter them from making the diagnosis.

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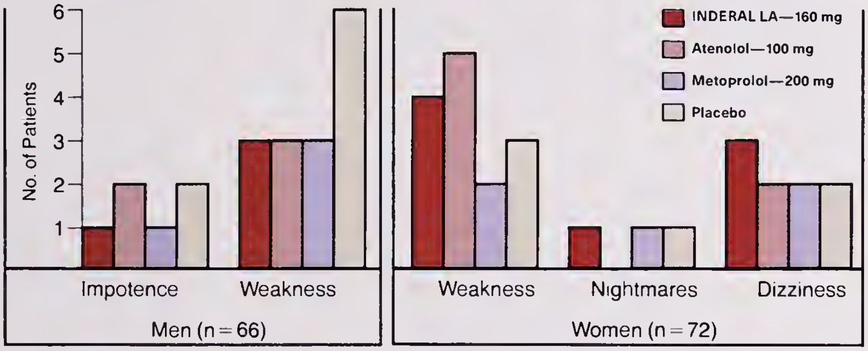

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INDERAL LA should not be used in the presence of congestive heart failure, sinus bradycardia, cardiogenic shock, heart block greater than first degree, and bronchial asthma.

Please turn page for brief summary of prescribing information.

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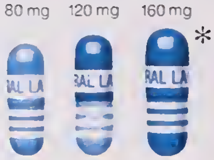
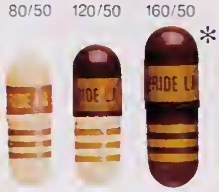
(PROPRANOLOL HCl)



ONCE-DAILY LONG ACTING CAPSULES

INDERIDE® LA

Each capsule contains propranolol HCl (INDERAL® LA), 80 mg, 120 mg, or 160 mg, and hydrochlorothiazide, 50 mg



BRIEF SUMMARY *(FOR FULL PRESCRIBING INFORMATION, SEE PACKAGE CIRCULARS.)*

INDERAL® LA Brand of PROPRANOLOL HYDROCHLORIDE **(Long Acting Capsules)**
INDERIDE® LA Brand of PROPRANOLOL HYDROCHLORIDE (INDERAL® LA) and HYDROCHLOROTHIAZIDE **(Long Acting Capsules)**

INDERAL LA and INDERIDE LA Capsules should not be considered simple mg-for-mg substitutes for INDERAL and INDERIDE Tablets Please see package circulars

CONTRAINDICATIONS

Propranolol hydrochloride (INDERAL® LA): Propranolol is contraindicated in 1) cardiogenic shock 2) sinus bradycardia and greater than first degree block, 3) bronchial asthma, 4) congestive heart failure (see WARNINGS) unless the failure is secondary to a tachyarrhythmia treatable with propranolol

Hydrochlorothiazide: Hydrochlorothiazide is contraindicated in patients with anuria or hypersensitivity to this or other sulfonamide-derived drugs

WARNINGS

Propranolol hydrochloride (INDERAL® LA): CARDIAC FAILURE Sympathetic stimulation may be a vital component supporting circulatory function in patients with congestive heart failure, and its inhibition by beta blockade may precipitate more severe failure Although beta blockers should be avoided in overt congestive heart failure, if necessary they can be used with close follow-up in patients with a history of failure who are well compensated, and are receiving digitalis and diuretics Beta-adrenergic blocking agents do not abolish the inotropic action of digitalis on heart muscle

IN PATIENTS WITHOUT A HISTORY OF HEART FAILURE, continued use of beta blockers can, in some cases lead to cardiac failure Therefore, at the first sign or symptom of heart failure, the patient should be digitalized and or treated with diuretics, and the response observed closely, or propranolol should be discontinued (gradually if possible)

IN PATIENTS WITH ANGINA PECTORIS, there have been reports of exacerbation of angina and, in some cases, myocardial infarction following *abrupt* discontinuance of propranolol therapy Therefore, when discontinuance of propranolol is planned the dosage should be gradually reduced and the patient carefully monitored In addition, when propranolol is prescribed for angina pectoris, the patient should be cautioned against interruption or cessation of therapy without the physician's advice If propranolol therapy is interrupted and exacerbation of angina occurs it usually is advisable to reinstitute propranolol therapy and take other measures appropriate for the management of unstable angina pectoris Since coronary artery disease may be unrecognized, it may be prudent to follow the above advice in patients considered at risk of having occult atherosclerotic heart disease who are given propranolol for other indications

THYROTOXICOSIS Beta blockade may mask certain clinical signs of hyperthyroidism Therefore, abrupt withdrawal of propranolol may be followed by an exacerbation of symptoms of hyperthyroidism, including thyroid storm Propranolol does not distort thyroid function tests

IN PATIENTS WITH WOLFF-PARKINSON-WHITE SYNDROME, several cases have been reported in which, after propranolol, the tachycardia was replaced by a severe bradycardia requiring a demand pacemaker. In one case this resulted after an initial dose of 5 mg propranolol

MAJOR SURGERY The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial It should be noted however that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)— PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes In these patients, it may be more difficult to adjust the dosage of insulin Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease. In patients with renal disease thiazides may precipitate azotemia In patients with impaired renal function, cumulative effects of the drug may develop.

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma.

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL Propranolol should be used with caution in patients with impaired hepatic or renal function Propranolol is not indicated for the treatment of hypertensive emergencies

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure Patients should be told that propranolol may interfere with the glaucoma screening test Withdrawal may lead to a return of increased intraocular pressure

CLINICAL LABORATORY TESTS Elevated blood urea levels in patients with severe heart disease elevated serum transaminase alkaline phosphatase, lactate dehydrogenase

DRUG INTERACTIONS Patients receiving catecholamine-depleting drugs, such as reserpine, should be closely observed if propranolol is administered The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity, which may result in hypotension marked bradycardia, vertigo syncopal attacks or orthostatic hypotension

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential In 18-month studies, in both rats and mice, employing doses up to 150 mg kg day, there was no evidence of significant drug-induced toxicity There were no drug-related tumorigenic effects at any of the dosage levels Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY Pregnancy Category C Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose There are no adequate and well-controlled studies in pregnant women Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

NURSING MOTHERS: Propranolol is excreted in human milk Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE Safety and effectiveness in children have not been established

Hydrochlorothiazide: GENERAL Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely Hyponatremia hypochloremic alkalosis, and hypokalemia Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids Medication such as digitalis may also influence serum electrolytes Warning signs irrespective of cause are Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness muscle pains or cramps, muscular fatigue hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather appropriate therapy is water restriction, rather than administration of salt, except in rare instances when the hyponatremia is life-threatening In actual salt depletion, appropriate replacement is the therapy of choice

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy

Insulin requirements in diabetic patients may be increased, decreased or unchanged Diabetes mellitus which has been latent may become manifest during thiazide administration

If progressive renal impairment becomes evident consider withholding or discontinuing diuretic therapy

Thiazides may decrease serum PBI levels without signs of thyroid disturbance

Calcium excretion is decreased by thiazides. Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function

DRUG INTERACTIONS Thiazide drugs may increase the responsiveness to tubocurarine

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient Thiazides may decrease arterial responsiveness to norepinephrine This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use

PREGNANCY Pregnancy Category C Thiazides cross the placental barrier and appear in cord blood The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus. These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult

NURSING MOTHERS Thiazides appear in human milk If use of the drug is deemed essential, the patient should stop nursing

PEDIATRIC USE Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy

Cardiovascular: Bradycardia, congestive heart failure intensification of AV block, hypotension; paresthesia of hands; thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type

Central Nervous System: Lightheadedness; mental depression manifested by insomnia, lassitude, weakness fatigue; reversible mental depression progressing to catatonia, visual disturbances, hallucinations, an acute reversible syndrome characterized by disorientation for time and place, short-term memory loss; emotional lability slightly clouded sensorium and decreased performance on neuropsychometrics

Gastrointestinal. Nausea vomiting, epigastric distress, abdominal cramping diarrhea constipation, mesenteric arterial thrombosis, ischemic colitis

Allergic Pharyngitis and agranulocytosis, erythematous rash, fever combined with aching and sore throat, laryngospasm and respiratory distress

Respiratory Bronchospasm

Hematologic Agranulocytosis, nonthrombocytopenic purpura, thrombocytopenic purpura

Auto-Immune In extremely rare instances, systemic lupus erythematosus has been reported.

Miscellaneous Alopecia, LE-like reactions, psoriasiform rashes, dry eyes, male impotence; and Peyronie's disease have been reported rarely Oculomucocutaneous reactions involving the skin serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol

Hydrochlorothiazide:

Gastrointestinal. Anorexia gastric irritation, nausea, vomiting cramping diarrhea, constipation jaundice (intrahepatic cholestatic jaundice), pancreatitis, sialadenitis

Central Nervous System Dizziness, vertigo, paresthesias, headache, xanthopsia

Hematologic Leukopenia, agranulocytosis, thrombocytopenia aplastic anemia

Cardiovascular Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics)

Hypersensitivity Purpura, photosensitivity, rash urticaria necrotizing angiitis (vasculitis, cutaneous vasculitis); fever respiratory distress, including pneumonitis, anaphylactic reactions.

Other Hyperglycemia glycosuria hyperuricemia, muscle spasm; weakness, restlessness, transient blurred vision

Whenever adverse reactions are moderate or severe thiazide dosage should be reduced or therapy withdrawn

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REFERENCE:

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Smokers' Wording Preferences for Hospital No-Smoking Signs

THOMAS E. KOTTKE, M.D., M.S.P.H.,[*] and
SHERYL ARNESON, M.S., M.A.S.[*]

The wording of no-smoking signs in smoke-free hospitals may have an important influence on acceptance of smoking prohibitions. Fifty consecutive people smoking in a hospital waiting area were asked to give their opinions about ten different no-smoking signs. Signs that threatened punishment were least acceptable and most offensive. Signs that emphasized patient health were most acceptable and generated the fewest negative comments.

Following Minnesota's lead, both the Surgeon General[1] and the American Medical Association (AMA)[2] have called for a smoke-free society by the year 2000—a resolution first adopted by the Hennepin County Medical Society[3] and the Minnesota Medical Association (MMA).[4] As a move toward that goal, a number of health organizations, including the MMA[5] and AMA,[6] have called for smoke-free health care facilities. To implement this challenge, the University of Minnesota Heart Hospitals earlier attempted to eliminate all smoking areas in 1982.[7] All waiting areas and patient care areas were posted with the notice "Not smoking is the most important action you can take to protect your heart, smoking is not allowed in the Heart Hospital. Thank you for your cooperation" (Figure 1).

In a pre-test, this sign was acceptable to a sample of 25 consecutive patients admitted to the cardiology service. The sign was not, however, pre-tested with visitors. Within hours after the new policy was posted, angry visitors began calling the Patient Relations Department to complain that the hospital did not have the right to treat visitors without consent. As a result, smoking was once again permitted in the hospital.

Because the non-smoking message originally delivered was unacceptable to visitors, we surveyed 50 consecutive people smoking in a hospital waiting area to determine if differently worded signs evoked significantly different responses from smokers.

Methods

Ten differently worded no-smoking signs were selected from those suggested by University of Minnesota faculty and staff. In October 1984, 50 consecutive people smoking in the waiting area at the main entrance of the University of Minnesota Hospitals and Clinics were asked to give their reactions to these ten no-smoking signs. The respondents were asked to rank the three signs they found most effective; the three signs they found most counterproductive, that is, the signs that made them want to smoke in spite of the signs; and the three signs they found most offensive. The respondents were also asked to give reasons for their choices.

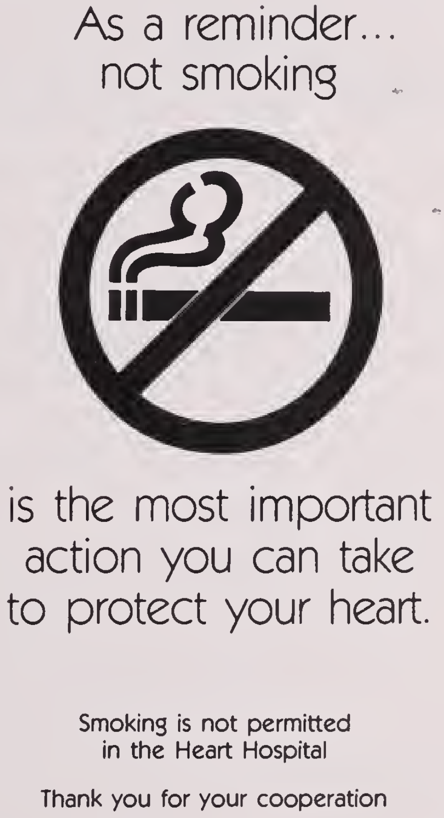

Figure 1 - Although this sign was attractive to public health workers and acceptable to patients, it was unacceptable to visitors. The visitors successfully argued that they were treated without consent, and the signs were removed.

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Results

Although all signs were chosen as "most effective" by at least one person, certain signs were clearly perceived as more effective than others (Table 1). The signs perceived as most effective provided information in a simple and straightforward manner (signs 1 and 3), or were based on patients' needs (signs 8 and 9).

Certain signs were reported to be more counterproductive than others. The signs most frequently reported to be counterproductive were those that threatened retaliation (signs 1 and 5) for smoking. A sign perceived by the respondents as hostile and sarcastic (sign 10) was also frequently listed as most counterproductive.

The signs most frequently reported to be most offensive were those that threatened retaliation (signs 1 and 5). The respondents who chose sign 7 as most offensive reported that they did so because the sign seemed negative and insensitive. The respondents who chose sign 10 as most offensive reported that the sign seemed rude and judgmental, and called too much attention to smoking.

Discussion

Smoking is clearly a threat to patients' health, especially those recovering from myocardial infarction, lung disease, and diabetes.[8-10] Smoking by hospital faculty and employees encourages visitors to smoke,[11] and smoking areas in hospitals lead patients, faculty, and employees to believe that health care providers approve of smoking.[12] The majority of patients we recently surveyed agreed that a smoke-free hospital would be an appropriate way to emphasize the health hazards of smoking.[12]

We have found that even among faculty and staff who wish to eliminate smoking in a hospital, it is very difficult to agree on the wording of the signs that prohibit smoking. Some wish to have a very strongly worded sign, others wish to give an educational message to the sign. Smoking prohibition as a health education message is clearly not acceptable to some visitors.

Phrasing the no-smoking message in a manner that is acceptable to patients, visitors, and employees is important if a policy of smoke-free hospitals is to be instituted successfully. The one trial of smoking signs that we could find in the literature concluded that positively worded signs were more effective than signs that threatened retaliation for smoking.[13]

Health-care sociologist Talcott Parsons observed that patients are afforded special rights by those who are not ill.[14] This trial suggests that

TABLE 1

Responses of 50 smokers to ten differently worded no-smoking messages (%)

	Signs	*Most Effective*	*Most Counter-productive*	*Most Offensive*
1.	Hospital smoking policy strictly enforced. No smoking.	14	10	10
2.	Smoking interferes with the medical treatment of heart disease, lung disease, diabetes, and cancer. Please do not smoke. The Medical Faculty	8	4	0
3.	No Smoking.	24	6	6
4.	Consider the health of yourself and our patients the next time you're dying for a cigarette. Remember, that's what you're doing. No smoking.	4	6	2
5.	No smoking—offenders subject to fine.	6	12	32
6.	Kicking the habit of smoking is better than kicking the habit of life. Consider your health and the health of others. Please do not smoke. The Medical Faculty	8	4	4
7.	Because of smoking, more women will die next year of lung cancer than of breast cancer. Please do not smoke. James Moller, M.D., Chief of Staff	4	8	16
8.	Consider the health of our patients. Please do not smoke.	14	0	0
9.	Our patients need a smoke-free environment for full recovery. Please do not smoke. James Moller, M.D., Chief of Staff	16	0	2
10.	This is a smoking area only because some visitors and patients insist on smoking against medical advice. Please do not smoke.	2	16	22
	Chi-square (9 d.f.)	21	20	47
	p	<.025	<.025	<.005
	Unable to answer	0	34	6

basing health care facility no-smoking messages on these rights may be the most acceptable and least offensive way to deliver this message.

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Minnesota Smoke-Free Health Care Facilities

As the centers of health care, hospitals can serve as role models for other organizations, businesses, and the community. Recognizing that role, growing numbers of hospitals and other health care facilities around the country are restricting smoking to a very few areas—or prohibiting it altogether.

Such an effort is underway in Minnesota. Here, a statewide project, "Smoke-Free Hospitals by 1990," was developed by the Coalition for a Smoke-Free Society 2000, which is sponsored by the Minnesota Medical Association and a number of other health agencies in the state.

The project, funded by a $50,000 research grant from the Minnesota Department of Health, is designed to persuade as many hospitals as possible to become smoke-free and to discover how this best can be done.

As part of the project, the Coalition is providing training and on-going consultation to 56 hospitals randomly selected to serve as "interventional" facilities. Another 56 hospitals serve as the "control group" and receive a self-help manual but no formal training. The manual, "Clean Air Health Care," was developed by the University of Minnesota and is distributed to both the interventional and control groups.

Originally, the Coalition had hoped to involve 100 hospitals in the project; in its first four months, 112 of Minnesota's 188 hospitals had joined.

Already, a number of hospitals and clinics have declared themselves completely off limits to smoking and others have set target dates. Following is a list of those facilities and the dates they have chosen to become smoke-free:

Hospitals

Mercy Hospital
Mooselake
(May 1, 1986)

Swift County Benson Hospital
Benson
(September 1986)

Community Mercy Hospital
Onamia
(January 1, 1987)

United Hospital
Blue Earth
(January 1, 1987)

North Memorial Medical Center
Robbinsdale
(May 1, 1987)

Minneapolis Children's Medical Center
Minneapolis
(June 1987)

Veterans Administration Hospital
Minneapolis
(August 1987)

Itasca Memorial Hospital
Grand Rapids
(July 1, 1987)

Northfield City Hospital
Northfield
(January 1987)

St. John's Hospital
Red Wing
(November 19, 1987)

St. Mary's Hospital
Rochester
(1987)

Rochester Methodist Hospital
Rochester
(1987)

Emmanual St. Joseph Hospital
Mankato
(January 1, 1988)

St. Gabriel's Hospital
Little Falls
(June 1988)

Clinics

Park Nicollet Medical Center
St. Louis Park
(January 1, 1986)

Share Health Care Association
St. Paul
(January 1, 1986)

Polinsky Medical Rehabilitation Center
Duluth
(January 1986)

Interstate Medical Center
Red Wing
(May 1986)

Group Health, Inc.
Minneapolis
(1987)

Mayo Clinic
Rochester
(1987)

Fridley Medical Clinic
Fridley
(August 1987)

Copies of "Clean Air Health Care," a guide to establishing smoke-free health care facilities, can be ordered from the Minnesota Coalition for a Smoke-Free Society 2000.

The cost for one copy is $5.75; for two or more, the cost is $4.75 each. Checks should be payable to the Minnesota Coalition for a Smoke-Free Society 2000. Mail check and order information (your name, mailing address, telephone number) to the Coalition at: Suite 400, 2221 University Avenue SE, Minneapolis, Minnesota 55414.

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MMIE Malpractice Claim Review

Orthopedic Surgery

MMIE RISK MANAGEMENT COMMITTEE
PAUL S. SANDERS, M.D.,
CHAIRPERSON

Allegation

Misdiagnosis and communication failures resulting in delays in treatment.

Facts

The patient, a 45-year-old male, presented to the emergency room on January 17, 1985, with an injury to his right shoulder. Dr. X, the emergency room resident, interpreted an X-ray as showing an acromioclavicular joint dislocation. He discussed the results of the X-ray by telephone with Dr. Y, the on-call orthopedic surgeon. Dr. Y recommended hanging weight X-rays to determine the elevation of the clavicle. The hanging weight films showed no elevation, which was reported to Dr. Y by telephone. Based on the X-ray findings, Dr. Y recommended a shoulder immobilizer, ice packs, and active range of motion in one to two days as the pain subsided. The patient was also instructed to see Dr. Y or his primary physician within one to two days if the pain persisted.

After the patient left the emergency room, Dr. X reviewed the X-ray with another physician who diagnosed an anterior dislocation rather than the AC separation. Dr. X noted this change on the emergency room record under X-ray impression but did not change the final diagnosis. Dr. X did not notify Dr. Y or the patient of the change in diagnosis. The emergency room record was not sent to Dr. Y's office.

On the evening of January 18, the patient contacted Dr. Y's office because of increased pain. The patient reported to Dr. Y's partner, who was on-call, that he had been seen in the emergency room the prior evening for a shoulder separation. Based on the history given by the patient, Dr. Y's partner felt that the treatment was adequate and refilled the prescription for pain medication.

On January 21, the patient spoke with Dr. Y by telephone and was advised to come in for an appointment. The patient was told that arrangements would be made to see him within a day or two, and that he would be contacted by Dr. Y's office with an appointment time. Dr. Y wrote a memo to his office nurse instructing her to call the patient to arrange an appointment time before Dr. Y left on vacation. The memo was apparently lost and the patient was not called. He did not see Dr. Y again.

Five weeks later, on February 22, the patient was seen by another physician who diagnosed an unreduced anterior shoulder dislocation and possible axillary nerve palsy. The patient underwent an open reduction with insertion of pins, which were removed three weeks later. He was then started on a physical therapy program. One year after the injury he had reached maximum improvement but was left with a 15% permanent partial impairment.

Disposition

After negotiations with the claimant, this case was settled for a total payment of $35,000; $25,000 was paid on behalf of Dr. X, and $10,000 was paid on behalf of Dr. Y.

Reasons for Settlement

Appropriate treatment was initially delayed because Dr. X failed to advise Dr. Y of the change in diagnosis. Treatment was further delayed because Dr. Y's office failed to call the patient with an appointment time. The patient's subsequent treating physician stated that if the dislocation had been reduced promptly, there would have been little or no permanent impairment.

Risk Management Comments

As this case illustrates, communication failures can result in significant patient injury. The first error occurred when the emergency room physician did not communicate the change in diagnosis to the orthopedic consultant. The treatment recommendations made by Dr. Y were appropriate based on the initial diagnosis of an AC separation. Because he was not advised that the X-ray showed an anterior dislocation, Dr. Y was unable to make the appropriate treatment recommendations. The primary physician must convey all pertinent information about the patient's condition, including any new diagnostic findings, to the consultant so that accurate treatment recommendations can be made.

The second communication failure occurred when the patient was not advised of the change in diagnosis. Patients have a right to complete and accurate information about their diagnosis and treatment. It is the responsibility of the physician to notify the patient when a new diagnosis has been made. A system should be in place in the emergency room to notify the patient when there is a discrepancy between what the patient was told and a subsequent X-ray interpretation.

The third communication failure occurred in Dr. Y's office when the patient was not called with an appointment time. Every office should have a system to ensure that the doctor's orders are communicated to the nurse and carried out. Many malpractice claims arise because patients are not notified of test results and necessary follow-up appointments. It is a good idea for the doctor and the nurse to review all orders at the end of the day to make certain that appropriate action has been taken.

In this case, an initial error in diagnosis resulted in patient injury because of a series of failures of communication. Physicians must be diligent in their efforts to communicate effectively with patients and other health care providers to prevent patient injury and malpractice liablity.

CONTINUING MEDICAL EDUCATION
ST. PAUL-RAMSEY MEDICAL CENTER

Fall-Spring Conference Schedule

Mark your calendar now for these upcoming conferences:

1986	
October 3	Chemical Exposures: Emergency Response & Management, St. Paul, MN
October 9-10	Family Practice Today, St. Paul, MN
October 23-25	Emergency Medicine for Primary Care Physicians, St. Paul, MN
November 1	Bioethics Seminar: When is Limited Treatment the Best Treatment, St. Paul, MN
November 8	Neurology Update, St. Paul, MN
December 4-6	Cardiopulmonary Medicine, St. Paul, MN
1987	
January 30	Detection and Diagnosis of Substance Use Disorders, St. Paul, MN
February 6	Burn Care Update, St. Paul, MN
March 4-7	Fifth Annual Critical Care Conference, St. Paul, MN
March 20-21	Eighth Annual Occupational Medicine Update, St. Paul, MN
April 2-4	Strategies in Primary Care Medicine, St. Paul, MN
April 9-10	Obstetrics & Gynecology Update, St. Paul, MN

Information and registration: Continuing Medical Education, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; Phone 612/221-3992.

CME

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

SEPTEMBER, 1986

8-19 Fourth Annual Occupational Health and Safety Institute School of Public Health and Office of CME; University of Minnesota Continuing Education and Extension, Midwest Center for Occupational Health and Safety; Earle Brown Continuing Education Center, University of Minnesota, 1890 Buford Avenue, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, Continuing Education, Midwest Center for Occupational Health & Safety, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3992.

11-12 The First 30 Minutes: A Comprehensive Review of the Diagnosis and Management of Pediatric Emergencies Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Medical Education Coordinator, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55410; (612) 874-5884.

12 Conference for the Directors of Surgery in the Upper Midwest: Serious Infectious Complications in Surgery CME, Medical School, University of Minnesota; Minneapolis Marriott Hotel, City Center, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

14-19 Critical Issues in Health Laboratory Practice CME, Medical School, University of Minnesota; Spring Hill Center, 725 County Road 6, Orono, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

15-19 Team Management of Diabetes Mellitus International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

18-19 Annual Trauma and Critical Care Seminar CME, Medical School, University of Minnesota; Pillsbury Auditorium, HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

18-20 Teaching Geriatric Medicine CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55414; (612) 626-5525.

19 Pediatric Update St. Paul-Ramsey Medical Center; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

22-26 Team Management of Diabetes Mellitus International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

24-26 Advanced Cardiac Life Support Course Life Support Services, Inc.; Radisson University, Minneapolis, Minnesota. CONTACT: Life Support Services, PO Box 35085, Edina, Minnesota 55435; (612) 934-0862.

26 Selected Problems in Diabetes Mellitus The Duluth Clinic, Ltd.; Fitger's on the Lake, Spirit of the North Theater, Duluth, Minnesota. CONTACT: James G. Brueggemann, M.D., 400 East Third Street, Duluth, Minnesota 55805; (218) 722-8364.

26 Northwestern Pediatric Society Annual Meeting Northwestern Pediatric Society; Thunderbird Hotel, 2201 East 78th Street, Bloomington, Minnesota. CONTACT: Mark Nammacher, M.D., 6845 Lee Avenue North, Brooklyn Center, Minnesota 55429; (612) 566-9500.

26-27 New and Emerging Issues in Occupational Medicine North Centeral Occupational Medicine Association; Mayo Clinic, Rochester, Minnesota. CONTACT: Mel Amundsen, M.D., Mayo Clinic, Rochester, Minnesota 55905; (507) 284-2511.

26-27 Adolescent Medicine Conference: High Risk Youth CME, Medical School, University of Minnesota; Earle Brown Center, 1890 Buford, St. Paul, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

26-27 Sexual Attitude Reassessment Seminar Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota; Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota. CONTACT: Diane Campbell, Program in Human Sexuality, 2630 University Avenue SE, Minneapolis, Minnesota 55414; (612) 376-7520.

OCTOBER, 1986

1-3 Annual Internal Medicine Review CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

1-4 2-D/Doppler and Color Flow Imaging in Congenital Heart Disease Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

3 Chemical Exposures: Emergency Response & Management St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

5-8 Institute on Human Fertility CME, Medical School, University of Minnesota, Sheraton Park Place Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

6-10 Team Management of Diabetes Mellitus International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

8-11 **Principles of Colon and Rectal Surgery** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

9-10 **Family Practice Update** St. Paul-Ramsey Medical Center; Holiday Inn East, I-94 and McKnight Road, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

9-10 **Integration of Perinatal Care—Twelfth Annual Meeting of the Minnesota Perinatal Organization** Minnesota Perinatal Organization; Radisson Arrowwood Resort, Alexandria, Minnesota. CONTACT: Marlene Wuelruich, 4219 Georgia Avenue North, Crystal, Minnesota 55428; (612) 535-1637.

10-11 **Head Trauma Rehabilitation** Knapp Rehabilitation Center; Pillsbury Auditorium, Minneapolis, Minnesota. CONTACT: Knapp Rehabilitation Center, 900 South 8th Street, Minneapolis, Minnesota 55404; (612) 347-3950.

15-18 **The 20th Annual Orthopaedic and Trauma Seminar** Hennepin County Medical Center; Pillsbury Auditorium, HCMC, 701 Park Avenue South, Minneapolis, Minnesota. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office 813, 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2812.

17 **Current Concepts in Cardiology of the Elderly** CME, Medical School, University of Minnesota; Pillsbury Auditorium; HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

17-18 **Office Management of Ear, Nose and Throat** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

18-19 **Update in Cardiology**, Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-22 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-24 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

22-24 **Obstetrics and Gynecology Annual Autumn Seminar** CME, Medical School, University of Minnesota; Marriott Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

23-25 **Emergency Medicine for Primary Care Physicians**; St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

24 **E.T. Bell Pathology Symposium** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

October 31 - November 1 **Primary Care Orthopedics** Park Nicollet Medical Foundation; Naegele Auditorium, Park Nicollet Medical Center, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Elaine Anderson, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3703.

NOVEMBER, 1986

3 **ENT for Primary Care Physicians** Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

7 **Pediatric Orthopedics: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55404; (612) 874-5884.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

8-9 **Minnesota Society of Neurological Sciences 1986 Annual Scientific Meeting** Minnesota Society of Neurological Sciences; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Susan Anton-Johnson, Executive Secretary, 4225 Golden Valley Road, Minneapolis, Minnesota 55422; (612) 725-6767.

13-15 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota; (612) 221-3980.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

17-21 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

23 **American College of Physicians, Minnesota Chapter, Regional Meeting** American College of Physicians; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, Minnesota. CONTACT: Alvin L. Schultz, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55404; (612) 347-2702.

DECEMBER, 1986

1-5 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

4-6 **Coronary Heart Disease** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

CME Continuing Medical Education

Medical School, Continuing Education and Extension
UNIVERSITY OF MINNESOTA

In our 50th year
serving physicians and other health professionals
in Minnesota, the region, and the nation.

1986 SEPTEMBER - DECEMBER

Sept 5th - 6th	Medical Directors Conference
8th - 12th	Radiology: 86 Gastrointestinal & Abdominal Interventional Radiology
13th	Conference for the Directors of Surgery in the Upper Midwest: Serious Infections in Surgery
14th - 19th	Critical Issues in Health Laboratory Practice
18th - 20th	Geriatric Medicine For Directors of Family Practice Residencies
18th - 20th	Trauma & Critical Care Seminar
26th - 27th	Adolescent Medicine: The High Risk Youth
Oct 1st - 3rd	Internal Medicine Review
5th - 8th	Institute on Human Fertility
8th - 11th	Principles of Colon & Rectal Surgery
17th - 18th	Office Management of Ear, Nose, and Throat
17th	Current Concepts in Cardiology of the Elderly
22nd - 24th	Annual Autumn Obstetrics and Gynecology Seminar
24th	E.T. Bell Pathology Symposium: New Concepts in Hematopathology
Dec 6th	Epilepsy Update

SELECTED 1987 COURSES

Mar 4th - 5th	Drug Therapy Symposium
Apr 6th - 7th	Annual Ophthalmology Course: Pediatric Strabismus
10th - 11th	Eating Disorders
20th - 24th	Family Practice Review: Update 1987
28th - 29th	Alzheimer's Disease: Toward a Standard of Care
May 15th - 16th	The Complicated Diabetic
17th - 20th	North American Primary Care Research Group
19th	Symposium on Gynecologic Oncology
20th - 22nd	Current Concepts in Radiation Therapy
29th - 31st	Surgery for the Primary Care Physician (Brainerd, MN)
June 5th - 6th	Workshops on Clinical Hypnosis
10th - 12th	Laboratory Medicine Course: DNA Technology, Monoclonal Antibodies, Chromosomal Analyses
17th - 19th	Annual Surgery Course: Progress in Vascular Surgery
24th - 26th	Topics and Advances in Pediatrics
July 8th - 11th	Orthopaedic Surgery - The Knee: Repair, Reconstruction, and Replacement

1987 Schedule Subject to Change

Box 202 UMHC, 420 Delaware Street S.E., Minneapolis, MN 55455 (612) 626 - 5525

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Out-of-state ads must be prepaid. Telephone ads will not be accepted. The right is reserved to decline or withdraw advertisements at the publisher's discretion. The publisher is not responsible for clerical or typographical errors.

Cancellation of ads must be made before the 1st of the preceding month.

Minnesota Medicine is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

Choice Downtown Medical Office to Share: Ideal for Internist or FP; (612) 224-7900. (R)

Unexpected Vacancy, Student Health Physician: Join seven other physicians serving 16,000 students. Pleasant setting, unique and challenging practice. Dedicated compatible staff. Nine-month academic year appointment plus negotiable summer work for additional compensation. Medical teaching appointment possibility. Write: Physician Recruitment Committee, Student Health Service, Washington State University, Pullman, Washington 99164-2302, before November 1, 1986. Washington State is an Equal Opportunity/Affirmative Action Employer. (R)

Medical Director for State Quality Assurance and Review Program. The Minnesota Department of Health is seeking the services of a qualified physician to act as Medical Director for the Quality Assurance and Review Program from October 1, 1986, to September 30, 1988, for an average of 4 to 8 hours per week. Applicants must submit a proposal in accordance with Minnesota Department of Administration procedures. Copies of the Request for Proposals and other information may be obtained from: Marian E. Lewis, Chief Quality Assurance and Review Program, Minnesota Department of Health, 717 Delaware Street SE, Minneapolis, Minnesota 55440; (612) 623-5292. The deadline for submission of the proposals is 4:30 p.m. September 20, 1986. (R)

Long-term Care Review Physicians: The Minnesota Department of Health is seeking the services of 7 to 10 qualified physicians located throughout the state to act as part-time consultants to the Quality Assurance and Review Program from October 1, 1986, to September 30, 1987. Applicants must submit a proposal in accordance with Minnesota Department of Administration procedures. Copies of the Request for Proposals and other information may be obtained from: Marian E. Lewis, Chief Quality Assurance and Review Program, Minnesota Department of Health, 717 Delaware Street SE, Minneapolis, Minnesota 55440; (612) 623-5292. The deadline for submission of the proposals is 4:30 p.m. September 20, 1986. (R)

St. Peter, Minnesota: Available immediately. Position of senior staff physician to work with progressive and forward-looking staff and administration to meet the medical needs of the patients at St. Peter Regional Treatment Center. JCAH accredited. Delightful setting in the heart of the Minnesota River Valley. University town of 10,000, ten minutes from Mankato, and one hour from the Twin Cities. Salary range in high-60s to 70s for BC/BE according to experience with excellent fringe benefit package and an opportunity for expanding income through minimal call. An AA/EOE employer. For further information contact: S.K. McHutchison, M.D., Clinical Director, St. Peter State Hospital, 100 Freeman Drive, St. Paul, Minnesota 56082; (507) 931-7707. (R)

Family Physician wanted, board certified or eligible, to join three young family physicians in a growing family practice group. New facility. Northfield is a small attractive college town (St. Olaf and Carleton) and is less than one hour from the Twin Cities and Rochester. Contact: Kenneth Sansome, M.D., David Larson, M.D., or Mark Mellstrom, M.D., Family Physicians of Northfield, 505 West Woodley, Northfield, Minnesota 55057; (507) 663-1261. (R)

Physicians Needed Over 400 opportunities nationwide!! Call (612) 786-1929 or send CV to: Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. (R)

The University of South Dakota School of Medicine is seeking a board certified/eligible

Internist to assist in the development and operation of a Women's Health Center. The position will include a university appointment as an assistant professor, involved in undergraduate and graduate training programs, as well as clinical activities with the Veterans Administration, ambulatory and inpatient care. Salary will be commensurate with credentials/experience. An excellent benefits package is included. For further information contact: Mary Ann Bauman, M.D., Assistant Professor, University of South Dakota School of Medicine, 2501 West 22nd Street, Sioux Falls, South Dakota 57105. (R)

Physician Practice Opportunities in the Chesapeake Bay or Tidewater Virginia area—especially attractive for physicians who would like to increase their fishing, powerboating, sailboating and other water-related activities from 3 to 4 months to 9 to 10 months per year and still live in an area with seasonal changes: spring flowers, sunny beaches, bright fall leaves, and winter snow. Medical Resources has been retained to conduct searches for: ENT/OTO, Family Practitioners, General Surgeon with thoracic and/or vascular training, GYN, Internal Medicine, IM/Cardio, IM/Gastro, IM/Pulmon, OB/GYN, Orthopedic Surgeons, Pediatricians, and Urologists. These are multispecialty group, partnership and solo practice opportunities with visit and moving expenses, substantial salary, compensation, and/or practice support packages provided. Specific example: Orthopedic Surgeon needed for 16-physician multispecialty group in 50,000 population service area. Current group ORS most anxious to add another. You could live on the Chesapeake Bay with boat at your door 15 minutes from clinic and 135-bed hospital, 40 minutes from 650,000 population metro area. All opportunities represent *needs*. You would be needed, not just the 8th, 17th, or 31st in your specialty. For further information please call collect: (301) 261-8622, or forward detailed CV to: David P. Harrison, President, Medical Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. All correspondence will be handled in a confidential manner. (R)

Physician Practice Opportunities - Birmingham, Alabama - Large multispecialty group seeking another OB/GYN, Family Practitioner, IM/Cardio, IM/Geriatric, and Emergency Medicine physicians. Visit expenses reimbursed. Call collect: (301) 261-8622 or forward detailed CV to: David P. Harrison, President, Medical Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. (R)

Good Samaritan Hospital is seeking a board eligible/certified Obstetrician/Gynecologist to join a well-established practice in Cincinnati. Excellent opportunity to practice quality medicine in a progressive, tertiary care teaching hospital with nationally recognized programs in medical education, residency training, and research. Contact: Recruitment Consultant Executive Offices, Good Samaritan Hospital, 3217 Clifton Avenue, Cincinnati, Ohio 45220. (R)

Family Practice: BC/BE Family Practitioner wanted to replace retiring third physician. Good practice potential and early partnership. Contact: Kathleen K. Simo, M.D., South Medical Clinic PA, 4310 Nicollet Avenue South, Minneapolis, Minnesota; (612) 827-3503. (R)

Internist needed for a busy, two-member practice in a community of 40,000 near Minneapolis, Minnesota. Competitive 1st year salary with incentive benefits and early partnership. Contact: Diagnostic Center, 304 Belle Avenue, Mankato, Minnesota 56001; (507) 388-1655. (R)

Green Bay, Wisconsin: 27-physician multispecialty group seeking BC/BE physicians in the following specialties: Family Practice, Ophthalmology, Dermatology, Plastic Surgery, Radiology, OB-GYN, Internal Medicine, and Pediatrics. Green Bay is a progressive community with an easy lifestyle, ample outdoor activities, excellent schools, and cultural activities. The Clinic offers competitive salary and excellent fringe benefits. Interested physicians please contact: W.J. Mommaerts, Administrator, West Side Clinic, sc, 1551 Dousman Street, Green Bay, Wisconsin 54303. (R)

Psychiatrist: An opening exists for a general psychiatrist with Hennepin Faculty Associates. Salary and benefits are generous. Requirements are: board eligibility, Minnesota licensure, and potential for appointment in the Department of Psychiatry at the University of Minnesota. Position would be largely involved with inpatient care of acutely ill patients at Hennepin County Medical Center and/or Metropolitan Medical Center. This would be in association with over a dozen other full-time psychiatrists engaged in clinical care, teaching, research, and forensics. Contact: William W. Jepson, M.D., Chief of Psychiatry, Hennepin County Medical Center, 701 Park

Avenue South, Minneapolis, Minnesota 55415. Phone: (612) 347-5764. (R)

Board certified or eligible family physician needed for an established clinic of five family physicians. No OB. Located in northern suburb of Twin Cities. Call: Marv Brooks, M.D., or Merle Mark, M.D.; (612) 533-2721. (R)

Family Practice opportunity with a busy, growing practice of young physicians. We are looking for a fifth doctor to join our clinic in Northfield, Minnesota, an attractive college community 30 miles south of the Twin Cities. As a progressive, yet historic-minded town, Northfield has a lot to offer the young family. Please contact: James M. Evans, M.D., or Gretchen D. Ehresmann, M.D., 710 South Division, Northfield, Minnesota 55057; (507) 645-5646 or (612) 375-0311. (R)

Wisconsin BC/BE Pediatrician for established hospital practice in northwestern Wisconsin. Attractive area with abundant cultural and recreational opportunities, competitive salary and benefits. Contact: Raymond Wolf; (414) 784-3258. (R)

Lake Superior: BC/BE Internist needed to join 2 young, quality-oriented general internists in a growing active practice. Natural beauty, small-town environment with sophisticated 105-bed hospital on the south shore of Lake Superior. Excellent salary and benefits. Write: Minnesota Medicine (802), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

1987 CME Cruise/Conferences on Selected Medical Topics - Caribbean, Mexico, Hawaii, Alaska, China/Orient, Scandinavia/Russia. 7-14 days year round. Approved for 20-24 CME Cat. 1 credits (AMA/PRA) and AAFP prescribed credits. Distinguished professors. Fly roundtrip free on Caribbean, Mexican, and Alaskan Cruises. Excellent group fares on finest ships. Registration limited. Pre-scheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Avenue, Huntington Station, New York 11746; (516) 549-0869. (R)

General Internist: We are in need of a qualified internist, preferred board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic loacted next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write: James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072; (612) 245-2212. 7-12/86

Physicians Needed: General internist, family practice, gastroenterologist (have all the equipment), obstetrician/gynecologist in 15-physician multispecialty group located in ideal community of 26,000. Ninety minutes from Twin Cities, excellent schools, etc. The clinic is a modern, well-equipped facility providing attractive guarantee and early partnership, plus other excellent benefits. Contact: Richard J. Graber, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Family Practice— Associate needed to join four-man group, all ABFP, one member leaving soon due to health and family reasons. 65-miles north of Minneapolis, city of 2,200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact: Keith Clinic, PA, 160 SW Second Avenue, Milaca, Minnesota 56353; or call collect (612) 983-6101. 3-11/86

Family Practitioner needed to join a progressive 11-physician group. Liberal fringes and financial package. Thirty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. 4-12/86

General Internist to join our group of five family practitioners, one obstetrician, and one surgeon. We are located in a central Minnesota community of 9,000. Most aspects of internal medicine are available to this already established practice, including gastroscopy and invasive cardiovascular monitoring. Competitive salary with option to buy into group after one year. For information contact: Michael Neudecker, M.D., Medical Center PA; 209 First Street SE, Little Falls, Minnesota 56345; (612) 632-6611. (R)

Urologist Wanted: Board certified-board eligible needed to join a well established downtown practice in Minneapolis. Send CV to: Loren R. Keldahl, M.D., 825 South 8th Street, Suite 402, Minneapolis, Minnesota 55404. 4-12/86

Used Medical Equipment: We Buy, Sell, Appraise, Liquidate, and Consign Used Equipment. From one piece to a whole hospital. Contact: Bob Godar at Scientific Locators, PO Box 29231, Brooklyn Center, Minnesota 55429; (612) 566-4953. 3-9/86

NEUROSURGEONS: One or two American-trained, Board Certified/Eligible Neurosurgeons needed by our 150-member multispecialty (one neurosurgeon) Medical Staff and Hospital in St. Cloud, Minnesota. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

NEONATOLOGIST: Board Certified/Board Eligible American-trained Neonatologist needed to develop a Level III Nursery in Central Minnesota. Active support by 9-member Pediatric Department. Complete fully equipped Respiratory Department. Excellent Nursery Facility and Equipment. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

PHYSIATRIST: A Medical Director is needed for our Rehabilitation Unit who is an American-trained, Board Certified/Eligible Physiatrist. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota, 70 miles northwest of Minneapolis/St. Paul, with a 150-member multispecialty medical staff. St. Cloud Hospital is a Level II trauma and emergency facility. The Rehabilitation Unit has a large (200,000 population) referral area. The present rehabilitation unit is DRG exempt, modern, fully equipped, staffed with 40 professionals (including PT, OT, speech pathologist, TR) with an outstanding 16-year history and is actively supported by the Medical Staff. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

PHYSICIAN OPPORTUNITIES available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write: Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

FAMILY PHYSICIAN OR GENERAL INTERNIST needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first-year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth, which provides excellent referral and continuing education resources. Call collect: (218) 834-2171, or write: Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

LUTSEN SEA VILLA: two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $85,000 - $80,000. Call: Jim (612) 333-8361. (R)

FAMILY PHYSICIAN to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Immediate Opening: Family Practitioner—River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes of the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman, or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona-based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years' experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

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Bemidji Clinic, Ltd. offers excellent opportunities for well-trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first-year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator, or N.A. Skogerboe, M.D., Medical Director; (218) 751-1280. (R)

Wanted: Family Practitioner—Ob/Gyn group practice, central Minnesota. Starting salary $55,000. Write: Minnesota Medicine (755), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Practice: Northridge Family Medicine Clinic, PA, is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, Minnesota. The hospital is well-equipped with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department, and well-equipped surgery department. Fairmont is unique with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, golf (3 courses), etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, Minnesota 56031. 4-9/86

Wanted in Northfield, Minnesota Family Physician, BE/BC, FP residency graduate to join growing two-man group in Northfield. OB and surgical skills desirable. Open hospital staff. Guaranteed salary plus productivity incentive. Full partnership one year. Please contact: Dr. David C. Halvorson or Dr. Donald L. Lum, 500 South Water Street, Northfield, Minnesota 55057; (507) 645-4444. 3-9/86

OB-GYN needed for busy, modern practice with one female board certified OB-GYN in suburban St. Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

PSYCHIATRIST board eligible/certified wanted for 11-M.D. Psychiatry Department of a University-affiliated group practice. Inpatient, outpatient, chemical dependency, prepaid, consultation, forensic, and subspecialty activities, active education, and research program. Full medical school faculty appointment, teaching and research interests desirable. Outstanding benefits, minimal on-call. Equal Opportunity Employer. Write: Minnesota Medicine (801), 2221 University Avenue, SE, Suite 400, Minneapolis, Minnesota 55414 3-9/86

PEDIATRICIAN: Excellent opportunity to join four pediatricians in a very active practice. Growing community, excellent hospital with teaching opportunities available. Close to Milwaukee. Contact: John R. Guy, M.D., 1111 Delafield Street, Waukesha, Wisconsin 53188; (414) 542-2536. 3-9/86

INTERNIST: Aspen Medical Group, PA, a physician-owned/managed multispecialty group practice in Minneapolis/St. Paul is now seeking internists for immediate openings. Salary and benefits are competitive. If interested, please send CV to: Maureen K. Reed, M.D., Aspen Medical Group, 1020 Bandana Boulevard West, St. Paul, Minnesota 55108. 3-9/86

FAMILY PRACTICE, INTERNAL MEDICINE, AND GENERAL SURGERY positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

FAMILY PRACTICE: Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic PA, 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

FAMILY PRACTITIONER wanted for branch offices of Park Nicollet Medical Center. Northern or southern suburbs of Minneapolis. Growing active practice. Full range of benefits. Contact: Milton Hanson, M.D., Park Nicollet Medical Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 931-2922. 3-9/86

FAMILY PRACTICE SPECIALIST: Marshfield Clinic Department of Family Medicine is seeking a BE/BC Family Practitioner to replace a retiring colleague. The physician joining this six-member department will enjoy the support of one of the nation's largest multispecialty groups, share the philosophy of family oriented care with a preventive focus, and enjoy full hospital privileges but without the distractions of OB or surgical responsibilities. Marshfield Clinic offers an excellent salary plus extensive fringe benefits. Please send CV to: John Folz, Assistant Director, Marshfield Clinic, Marshfield, Wisconsin 54449; or call collect (715) 387-5181. 3-9/86

FAMILY PHYSICIAN needed to replace retiring partner in thriving 3-FP full-service practice in Starbuck, Minnesota, on the state's 13th largest lake. Good hunting and fishing. Modern 9-year-old hospital. Twenty miles to university campus. Call or write: Robert Bosl, M.D., Starbuck Clinic, PA, Starbuck, Minnesota 56381; (612) 239-2231. (R)

PHYSICIAN PRECEPTOR in Family Practice. Upper Peninsula Health Education Corporation is accepting applications for a full-time family physician in a unique, rural medical education center. Responsibilities are patient care including obstetrics and clinical instruction of medical students of the Upper Peninsula campus of Michigan State University's College of Human Medicine. Requirements are board eligibility or certification in family practice with a commitment to medical education. Salary and rank commensurate with experience. Send inquiries to: John Hickner, M.D., Bay de Noc Family Health Center, Doctors Park, Escanaba, Michigan 49829; (906) 786-9510. 4-11/86

FAMILY PHYSICIAN/EMERGENCY ROOM: Full-time salary working weekends, primarily emergency room. Flexibility available. Falls Medical Center, PA, 105 Shorewood Drive, International Falls, Minnesota 56649. Please contact: Douglas A. Johnson, M.D., or A. Marc Gorden, M.D., at (218) 283-9431 for more information. (R)

FAMILY PRACTITIONER: Due to death of partner, a family practitioner is needed to join two remaining family practitioners in busy rural practice 175 miles west of Twin Cities. Serious candidates may obtain details about practice and community by contacting: Robert Ross, M.D., or Ronald Beyer, M.D., at Northside Medical Center; (612) 839-2516 or Richard Slieter, Administrator, Ortonville Area Health Services; (612) 839-2502 or by writing to the above at 750 Eastvold Avenue, Ortonville, Minnesota 56278. (R)

GENERAL INTERNIST: The St. Cloud Medical Group located in Central Minnesota has an immediate opening for a general internist to join a 23-physician, multispecialty group in St. Cloud, Minnesota. The department of internal medicine currently has four board certified internists, and is in the process of recruiting an additional board certified internist to that department. This opportunity affords a general internist a great financial and working opportunity. St. Cloud is one of the fastest growing communities in the state of Minnesota and is home to three major colleges. It is geographically located to provide quick access to the Metropolitan Twin Cities area. The St. Cloud community has excellent school systems available to the individual physician and his or her family members. If interested in this excellent opportunity, please call collect: Dr. Ronald Elg and/or Daryl G. Mathews, Administrator, at (612) 251-8181, and/or send CV to: St. Cloud Medical Group, PA, 1301 West St. Germain Street, St. Cloud, Minnesota 56301. 4-11/86

THE UNIVERSITY OF MINNESOTA SCHOOL OF DENTISTRY invites applications for Research Fellow (D.D.S. required) and Research Associate (Ph.D. required) positions. Applicants must have at least two years of research training. Positions will provide research expertise in planning and execution of research design and methodology. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities. Send resume, indicating areas of research training to: Dean Richard P. Elzay, University of Minnesota School of Dentistry, 515 Delaware Street SE, Minneapolis, Minnesota 55455. 1-9/86

Cover Photograph

Old Fisherman's Shack

James D. Roelofs, M.D., was aboard the Isle Royale Ferry when he took the cover photograph of an abandoned commercial fisherman's shack on a small island near Isle Royale. He used a Nikkormat SLR with a 52 mm lens and Kodachrome 64 film.

Dr. Roelofs is a radiologist practicing with Diagnostic Imaging Associates in Brainerd.

Cover Slides needed for Winter and Spring

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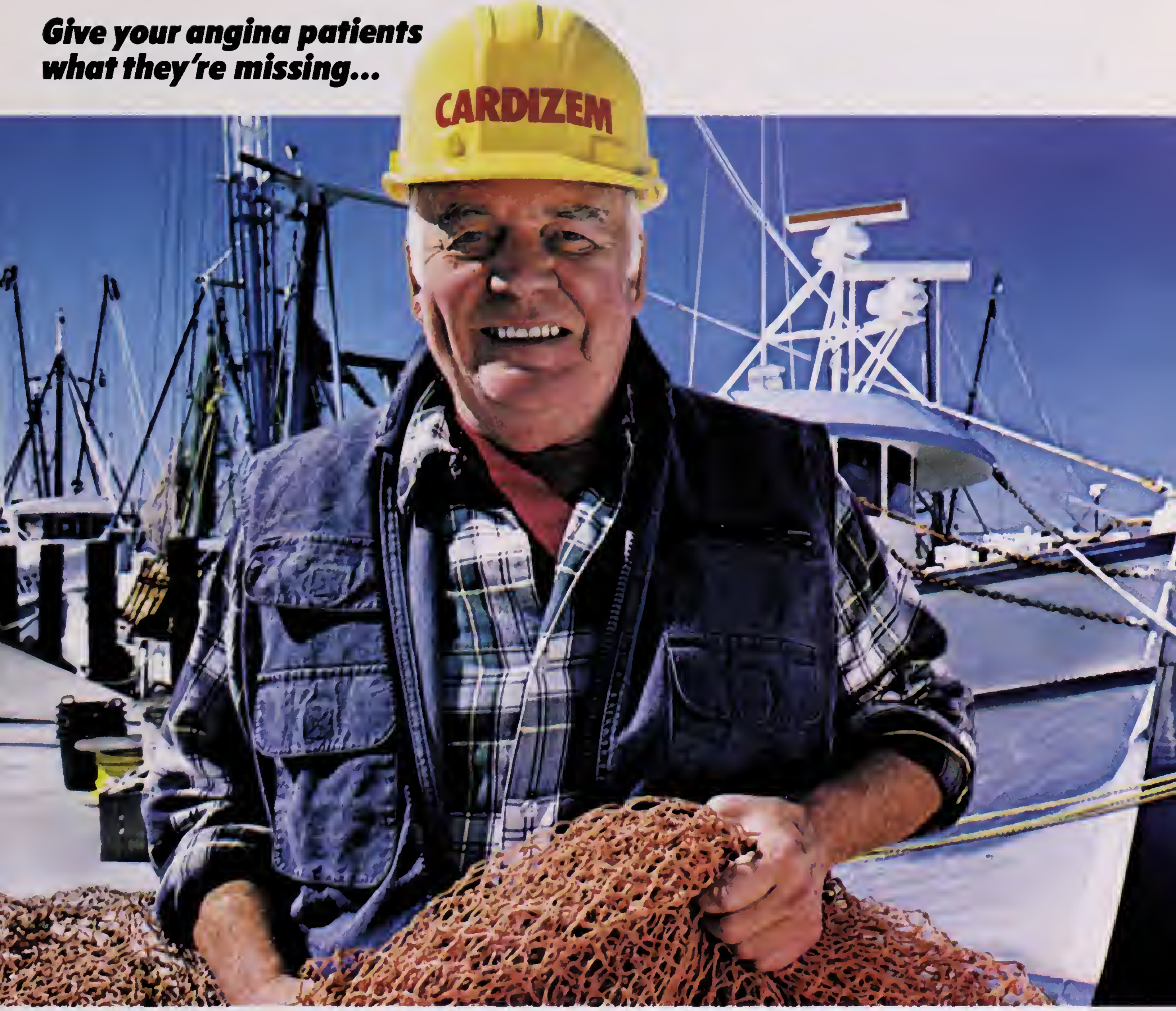

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****See Warnings and Precautions.***

Please see brief summary of prescribing information on the next page.

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FEW SIDE EFFECTS IN ANTIANGINAL THERAPY

60 mg tid or qid

Brief Summary
Professional Use Information

CARDIZEM®
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CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** *CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1,243 patients for 0 48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.*
2. **Congestive Heart Failure.** *Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt).*
   Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited Caution should be exercised when using the drug in such patients
3. **Hypotension.** *Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.*
4. **Acute Hepatic Injury.** *In rare instances, significant elevations in enzymes such as alkaline phosphatase, CPK, LDH, SGOT, SGPT, and other symptoms consistent with acute hepatic injury have been noted. These reactions have been reversible upon discontinuation of drug therapy The relationship to CARDIZEM is uncertain in most cases, but probable in some. (See PRECAUTIONS)*

PRECAUTIONS

General. *CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued In dogs, doses of 20 mg/kg were also associated with hepatic changes, however, these changes were reversible with continued dosing*

Drug Interaction. *Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS)*

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. *A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity There was also no mutogenic response in in vitro bacterial tests No intrinsic effect on fertility was observed in rats*

Pregnancy. *Category C. Reproduction studies have been conducted in mice, rats, and rabbits Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality These doses, in some studies, have been reported to cause skeletal abnormalities In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.*

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus

Nursing Mothers. *Diltiazem is excreted in human milk One report suggests that concentrations in breast milk may approximate serum levels If use of CARDIZEM is deemed essential, an alternative method of infant feeding should be instituted*

Pediatric Use. *Safety and effectiveness in children have not been established*

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition In many cases, the relationship to CARDIZEM has not been established. The most common occurrences as well as their frequency of presentation are. edema (2 4%), headache (2 1%), nausea (1 9%), dizziness (1.5%), rash (1.3%), asthenia (1 2%) In addition, the following events were reported infrequently (less than 1%):

Cardiovascular:	*Angina, arrhythmia, AV block (first degree), AV block (second or third degree — see conduction warning), bradycardia, congestive heart failure, flushing, hypotension, palpitations, syncope*
Nervous System.	*Amnesia, gait abnormality, hallucinations, insomnia, nervousness, paresthesia, personality change, somnolence, tinnitus, tremor.*
Gastrointestinal:	*Anorexia, constipation, diarrhea, dysgeusia, dyspepsia, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH (see hepatic warnings), vomiting, weight increase*
Dermatologic.	*Petechiae, pruritus, photosensitivity, urticaria.*
Other.	*Amblyopia, dyspnea, epistaxis, eye irritation, hyperglycemia, nasal congestion, nocturia, osteoarticular pain, polyuria, sexual difficulties*

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM. alopecia, gingival hyperplasia, erythema multiforme, and leukopenia. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established. Issued 7/86

See complete Professional Use Information before prescribing

References: 1. *Pepine CJ, Feldman RL, Hill JA, et al: Clinical outcome after treatment of rest angina with calcium blockers: Comparative experience during the initial year of therapy with diltiazem, nifedipine, and verapamil. Am Heart J 1983, 106(6):1341-1347* **2.** *Shapiro W: Calcium channel blockers Actions on the heart and uses in ischemic heart disease Consultant 1984,24(Dec):150-159* **3.** *Johnston DL, Lesoway R, Humen DP, et al: Clinical and hemodynamic evaluation of propranolol in combination with verapamil, nifedipine and diltiazem in exertional angina pectoris A placebo-controlled, double-blind, randomized, crossover study Am J Cardiol 19B5,55 680-687* **4.** *Cohn PF, Braunwald E: Chronic ischemic heart disease, in Braunwald E (ed). Heart Disease: A Textbook of Cardiovascular Medicine, ed 2 Philadelphia, WB Saunders Co, 1984 chap 39* **5.** *Schroeder JS. Calcium and beta blockers in ischemic heart disease When to use which Mod Med 19B2,50(Sept).94-116.*

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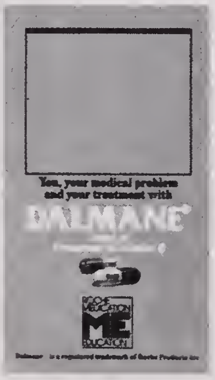
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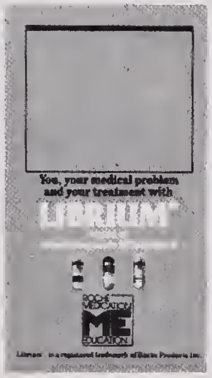
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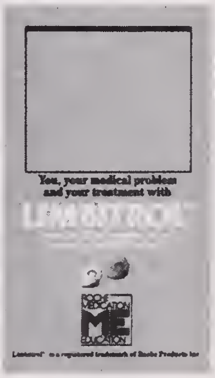
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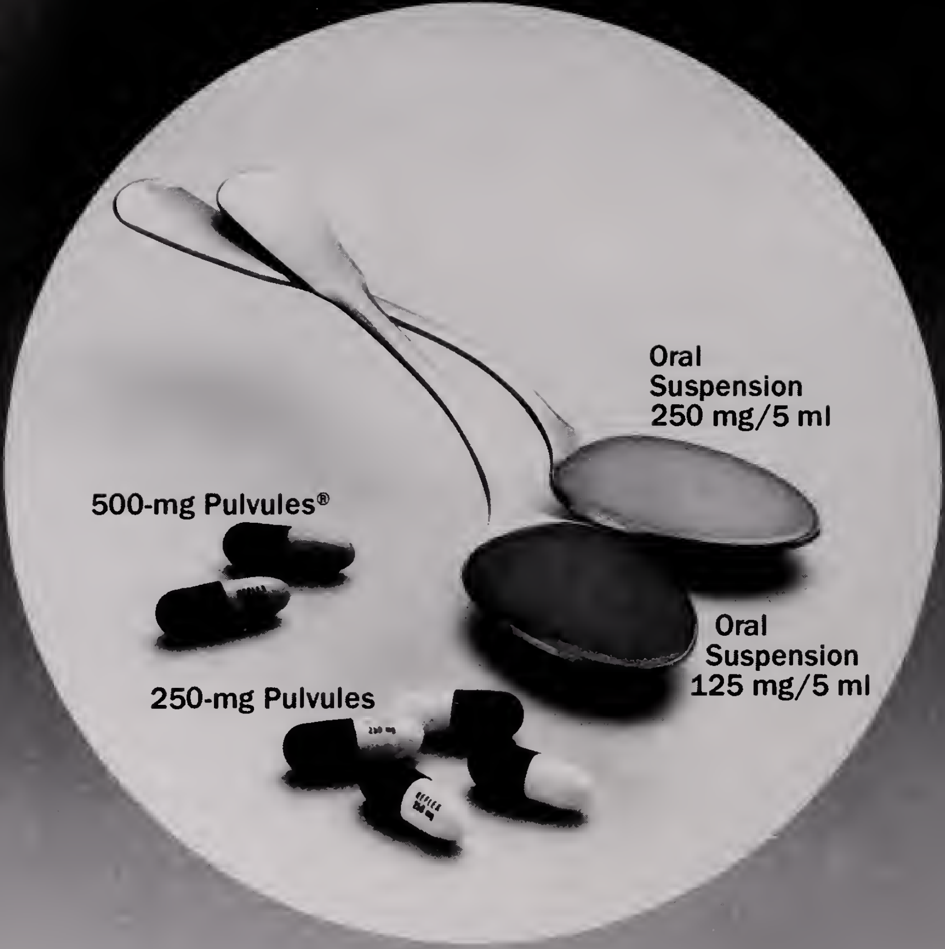

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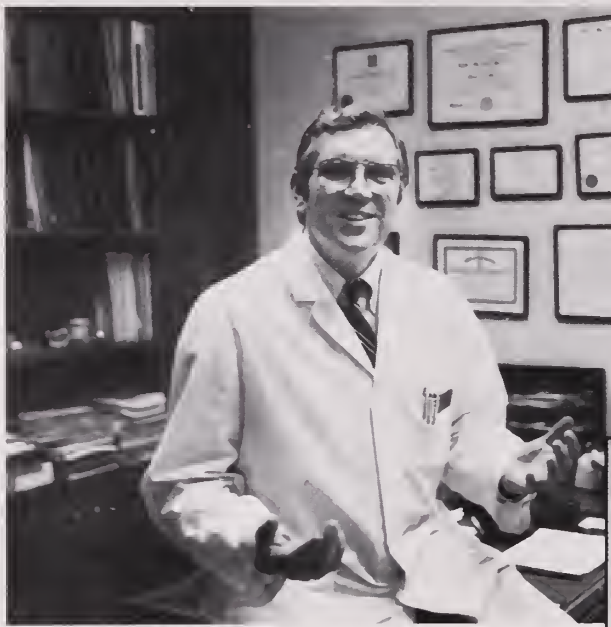

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President's Letter

Sex Education: A Physician's Responsibility?

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

Sex education was a straightforward, impressive experience in the 1940s in Tyler, Minnesota.

One of the local G.P.s would spend one hour with the sixth-grade boys and one hour with the girls, confirming our suspicions—or setting us straight—by describing the human anatomy and physiology in sufficient detail. As if that weren't enough, Dr. C. P. Johnson also brought along his specimens of variously aged, spontaneously aborted embryos. He delivered a strong lecture on the responsibilities of parenthood.

Did it work? I recall there were two "shotgun weddings" among our 28 graduates, some years there were none. I consider this relatively successful as there wasn't much else to do in Tyler in the 40s.

In the 1960s, we experienced a sexual revolution and for the past 20 years, **we have experienced a teenage pregnancy epidemic. The statistics are staggering. The individual and societal damage is incalculable.**

The U.S. is the only industrialized nation in the world where teenage pregnancy is increasing. Last year, one million teenage girls became pregnant in this country. Few teenage moms complete high school. Families of teen mothers are seven times more likely to live in poverty. The teen parent earns half the lifetime earnings of a woman who waits until age 20 to have her first child. Infant mortality, childhood illness, and child abuse are all higher among children of teenage mothers. Unemployment, poverty, and welfare dependency become the ingredients that make up a perpetual cycle.

What does this mean for today's physician? What is our responsibility? Dues dollars from the American College of Obstetrics and Gynecology (ACOG) funded a media campaign on unintended pregnancies. The dichotomy of the major TV networks' initial refusal to run the ads is close to ludicrous. Prime time shows seem to be so enamored with the glamour of "love" that they don't have air space to even hint at the consequent responsibilities.

Led by Dr. Joan Madden, several OB/GYNs and family physicians did their best to see that the ACOG ads ran in this state. A worthwhile project, but the chasm between those ads and individual teens taking the necessary responsibility for their actions is wide.

Discovery is an interesting program being tried by the Chicago public school system and the Northwestern University Medical School. It includes presentations by medical student volunteers to children attending an inner-city junior high school. The program is outlined in a January 1986 article in the *Journal of the American Medical Association*. The cost is low, but it does require involvement by the medical profession.

Another program involves a model clinic in St. Paul. Services such as gynecologic exams and counseling on contraception are offered. Again, the involvement of the medical profession is required.

The ACOG effort and the Chicago and St. Paul projects deserve special attention and show that our profession has been involved in seeking solutions. But, it occurs to me that such is the easy answer for a tough issue.

Certainly, we have a continuing obligation to provide the best medical care possible through these unfortunate, uniformly high-risk pregnancies. However, **I also believe that we hold responsibility for trying to prevent the pregnancies, just as we bear major responsibility for seeing that our pediatric patients receive necessary vaccines or that other patients receive needed medication.** It comes with the territory. Whether it's stitching a laceration, setting a leg, or checking the throat or stomach, the contact you have may be the *only* one the child-in-an-adult-body will have with a physician. And you know that *kid* isn't going to bring up the subject, so maybe it's your responsibility?

Maybe it's also time for us to get back into our local schools, involving ourselves, as authority figures, in the sex education process—mixing the theory of the 1985 Chicago model with the practical of the C. P. Johnson 1940 model.

Who knows, maybe one of us will reach a teen who, in 2020, will submit a column to *Minnesota Medicine* on the responsibilities of a physician.

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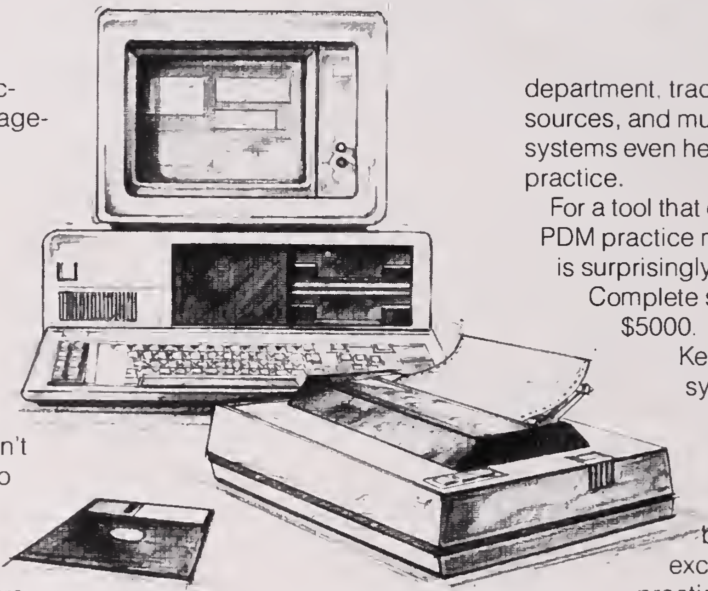

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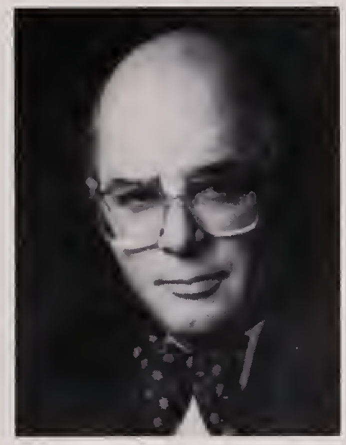

Editor's Notebook

The Corporate Transformation of Medicine in Minnesota: The Rationing of Health Care—Is it Inevitable?*

Second of Two Parts

Twentieth in a Series

DULUTH - If health care were any other industry, we would applaud its growth—just as we applaud growth in housing starts, in auto sales, and in increased consumer spending in other goods and services. Health care helps cure disease, repair shattered bodies, restore people to health, and return people to productive lives. Health care ought to be considered a social good.

An Unmanaged System

Right? Well, maybe. But not if health care is perceived to be an unmanaged, open-ended free-for-all with hospital administrators, high technology medical firms, and physicians foraging freely at the public trough. And not if you're a United States Steel manufacturer trying to stave off foreign competitors and trying to pay ever-escalating health costs in Gary, Pittsburgh, and Duluth. And not if you're an American automobile manufacturer, who pays four to six times what the Japanese pay for health care.

Comparing the U.S. to Other Countries

How much are Americans paying for health care compared to other countries? Consider this table from a recent *New England Journal of Medicine* article.[1] Note that we lead the world in "total health care spending," but observe also that we are well below other countries in "public expenditures" for health care (Table 1).

TABLE 1

Percent of Public Spending as Percent of Total Health Care

Country	*Total Bill as % of GNP*	*Public Bill as % of GNP*	*Percent of Public Bill as % Total Bill*
Sweden	9.6%	8.8%	92%
Norway	6.9	6.2	90
Britain	6.2	5.5	90
Italy	7.4	6.2	84
Germany	8.2	6.7	81
Canada	8.5	6.2	73
France	9.3	6.6	71
Belgium	6.5	4.6	71
Australia	7.5	4.9	65
Austria	7.3	4.6	63
United States	10.8	4.5	42
Ave. 20 countries	7.6	4.8	75

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*Presented at the third annual Lundberg Memorial Lecture, August 5, 1986, St. Luke's Hospital, Duluth, Minnesota. The views expressed here are my own and do not represent the views of the Minnesota Medical Association or the Board of Editors.

Why does the United States devote a smaller amount of its public spending to health care than almost any other country? Our penuriousness? Our lack of compassion? Our lack of a sense of social equity? Perhaps. But I suspect a big part of the reason is our enormous defense budget and our enormous budget deficit. Other countries do not devote as large a percent of their GNP to defense (Table 2). Nor do they carry such a huge budget deficit.

TABLE 2

Percent of Total United States Budget Devoted to Pension and Health Care Spending, to Defense and Net Interest on the Deficit, and to Non-defense Items.*

	Pension and Health Care as % of Total Budget		*Defense and Net Interest as % of Total Budget*		*Non-Defense Items as % Total Budget*	
1990	$9.1 trillion	(37%)	$11.7 trillion	(46%)	$3.8 trillion	(14%)
1985	9.3	(38%)	9.9	(41%)	5.1	(21%)
1980	8.8	(38%)	7.8	(34%)	6.4	(28%)
1975	8.4	(38%)	7.0	(31%)	7.1	(32%)
1970	6.1	(30%)	9.3	(46%)	4.8	(24%)
1965	4.4	(24%)	8.3	(46%)	5.3	(29%)

*Source: Congressional Budget Office.

For various reasons, but mostly because of a conservative tax revolution in the United States, the government has decided it cannot continue to reward the health care industry as lavishly as in the past. As a people, we have decided one cannot have both beds and butter. Hence DRGs, the freeze on physicians' government-derived incomes, and the cuts in Medicare.

There are even signs health care spending as a whole—from both private and public sources—may be leveling off. In 1985, spending rose at the lowest rate in two decades (Table 3).

TABLE 3

Percent of GNP Devoted to Health Care Since 1965*

Year	*Health Care Expenditures*	*Percent of GNP*
1985	$425.0 billion	10.7%
1984	390.2	10.3
1983	357.2	10.5
1982	323.6	10.2
1981	287.0	9.4
1980	248.1	9.1
1979	214.7	8.6
1978	189.7	8.4
1977	169.9	8.5
1976	150.8	8.5
1975	132.7	8.3
1974	116.1	7.9
1973	103.4	7.6
1972	94.0	7.7
1971	83.5	7.6
1970	75.0	7.4
1969	65.6	6.8
1968	58.2	6.5
1967	51.5	6.3
1966	46.3	6.0
1965	41.9	5.9

*Source: Congressional Budget Office.

Because of certain factors—glut of physicians, increased use of medical technology, and aging of the population—health care will remain a growth industry. After all, the rise in health care spending from $390 billion in 1984 to $425 billion in 1985 still constitutes a 9 percent growth in spending, more than three times the consumer price index.

But the drive to control, manage, or "ration" spending continues. Indeed, we have an explosion of "managed care" in this country. Those in the know tell me that from 1980 to 2000 we will have a complete flip-flop of the way we pay for health care—from 95 percent fee-for-service to 95 percent prepayment, capitation, or "discounted" fees.

The rationing of scarce resources, such as transplant organs, makes sense to most physicians. So does triage in times of war. But the rationing of abundant medical resources—doctors and hospitals, and medical technology—does not, particularly when we have an oversupply of beds and doctors.

The Problem of Rationing

The problem of rationing is tough enough in times of scarcity, but it is even tougher in times of oversupply. Why? Because you need the cooperation of those who do not believe a scarcity of dollars exists. Besides, American patients make no bones about their demands. Our media are flooded with pleas for access to experimental drugs; citizens lobby for changes in third-party payments for transplants; parents with children who need transplants go public in their appeals for organs.

How to Cope

How to cope? Should we have national health insurance and simply put a lid on health care spending? How else do we assure social equity and fairness and keep 37 million Americans without health insurance from falling through the cracks? Or should we develop a uniquely American way—a system of competing health care corporations and plans that mete out care to the middle class, the old, and the poor using modern management principles and market forces?

Or should we simply ration? What do the experts say?

What the Experts Say

- Mary Ann Baily, a George Washington University faculty member who was a policy advisor to President Reagan's Commission on Ethical Problems in Medicine, says at the least we ought to use the word "rationing" so we can talk openly about the issues involved.[2]

The problem is that politicians cannot use the word "rationing" because it is an admission of defeat of an administration's policies. The commission Baily served on refused to use the word "rationing" in its report. She says "rationing" is a more honest word than "allocating" because "rationing" stresses equity in the face of scarcity. "Rationing," however, is viewed as a harsh word, evoking thoughts of emergency or crisis and even wartime—times requiring triage methods.

- Uwe Reinhart, a Princeton health care economist, born in Germany and reared in Canada and now a U.S. Citizen, contends that the United States has always rationed by price.[3,4] He says he likes physicians but considers them businessmen, and therefore no different than any other purveyor of products in our economy. Physicians are human beings, no better and no worse than anyone else, including college professors, and they are subject to human weaknesses. The problem with rationing by price, he says, is that the system becomes heartless and unpredictable and punitive for the have-nots. Furthermore, the system depends on the goodness of the hearts of the care providers. He adds that the system worked fairly well when the payment structure was open-ended. But now that the federal brakes are being applied and costs are being shifted to the private side, the system is breaking down. He predicts we will have at least three levels or tiers of care: (1) cadillac care with designer hospital suites and boutiques of excellence for the very rich; (2) competing health care corporations for the middle class and the relatively well-off old; and (3) a closed-panel delivery system with limited capacity for the poor and the destitute old, akin to that of the British National Health Service.

- Henry Aaron, an economist at the Brookings Institute, and William Schwartz, a physician advisor to the Rand Corporation, contend that in the United States, we are not currently rationing, but that rationing is inevitable.[5] They suggest two stages for cost control. In the first stage, government, physicians, and business would join to eliminate useless medical services and would improve efficiency. And in the second stage, the system would cut beneficial services at the margins where the gains are too small to justify the costs. The British are far into the second. For example, they do not radiate glioblastomas, do not do renal dialysis for patients over a certain age, and perform cardiac bypasses in only a selected few. Aaron and Schwartz feel the economies in stage 1 are large but short-lived, so we shall have to follow the British lead sooner or later.

- Sociologist David Mechanic, a professor at Rutgers University and a frequent commentator on the United States' health system, believes three types of rationing exist: (1) rationing by price, (2) implicit rationing, and (3) explicit rationing.[6] Mechanic says we already ration by price. The competitive health plans envisioned by Ellwood are simply a method of managing by price, or by market forces, if you prefer. Implicit rationing means setting a limit by a total budget and allowing physicians to make decisions about what is necessary for the patient within the clear constraints of that budget. The British way is to cap the national budget devoted to health care. The American way is more likely to be capitation and prospective pricing. Explicit rationing, according to Mechanic, sets up an administrative authority who puts limits on expenditures and says what a doctor can and cannot do under certain circumstances. Mechanic favors the implicit rationing arrangement.

- And then there are our colleagues at the Minnesota Medical Association (MMA). You may not be aware of it, but the Minnesota Medical Association has taken a courageous, clear, and early stand on rationing in a position paper.[7] The position paper began with the following definitions: (1) rationing is a reasoned, equitable plan for the distribution of health care resources, in either an absolute or relative sense; and (2) cost control mechanisms are a means for assuring prudent use of our health care resources and reducing inefficiency to forestall the need for rationing. The MMA acknowledged that many of these cost-control mechanisms are already in place. Among these mechanisms are "gatekeeper" approaches, copayments, non-payment for use of providers outside the network, exclusion of certain procedures from payment, "discount" contracting, and prospective pricing.

According to the paper, society has not yet reached a consensus on whether rationing will be necessary. Therefore, the medical society concluded basic health care need not, and should not, be rationed at this time. Should rationing of basic health care be necessary, and basic health care should be a right in our society, the Association urged a full and open discussion among all sectors of society to determine the rules under which a rationed system should operate.

There may be no consensus on rationing, but there is a consensus that something is wrong with the system as it now operates. Because of our collegial culture, we physicians are reluctant to advocate the shakeout of colleagues and hospitals by eliminating the inefficient, expensive, and wasteful. And we are reluctant to admit that *more* care—with the use of the latest technologies, drugs, and innovation—is not necessarily the *best* care.

What to do?

We can begin by cooperating with others to reduce the fat in the system. But we should also serve as watchdogs by saying when the fat has been cut to the bone. We should complain to congressmen when elderly patients are discharged "quicker and sicker." We should protest HMO management methods that endanger patients or cause them inconvenience. We should, in short, continue to be patients' advocates. But let's be vocal about it. Let's be systematic. Let's inform the public through the media every time a patient is abused, neglected, underserved, or cut off by the system's inequities.

We can acknowledge that less care sometimes means better care, that outpatient care is sometimes better than hospital care, and that watchful waiting and conservative care is better than heroic intervention.

We can study, understand, and correct large-scale variance in medical practice styles. As logical people, we ought to say there is no reason average Medicare patients ought to pay 40 percent more in Boston than in the Twin Cities, and let's admit there is no excuse for hysterectomy rates being five times higher in one region of the country than the other.

We can take the lead in defining quality and collecting information that makes its definition and delineation possible. We should develop "think-tanks" that give intellectual legitimacy to our efforts to pursue quality. We should collect and make available information to consumer groups about our relative performance levels and the comparative outcomes of our patients. We should embrace Medigroups and other quality control measures, particularly those that have been fostered and developed in HMOs, both for corrections of deficiencies and for assisting consumers so they can choose among providers.

And we must develop more direct and effective relationships between physicians and industry, government, and community officials to make sure they understand our commitment to measuring excellence. We need to convince decision makers and policymakers that health care expenditures are not frivolous and that their dollars are being spent wisely in a way that improves efficiency and productivity.

Concluding Thoughts

Paul Ellwood, Walter McClure, and other health care analysts have divided the health care world into Providers and Purchasers. It is a Grand Divide that most physicians, including myself, find distasteful, because it reduces a complex profession to a simple business proposition. But perhaps this division is also useful. For too long, we have thought only in terms of the Provider side of our brains. The time has come for us to think like Purchasers, to place ourselves in their shoes, and to persuade them that what we are doing is humane, efficient, effective, productive, and in their best interests as well as our patients', and society's. Think like a Purchaser, argue your case in their terms, and you will be able to cross the Great Purchaser-Provider Divide.

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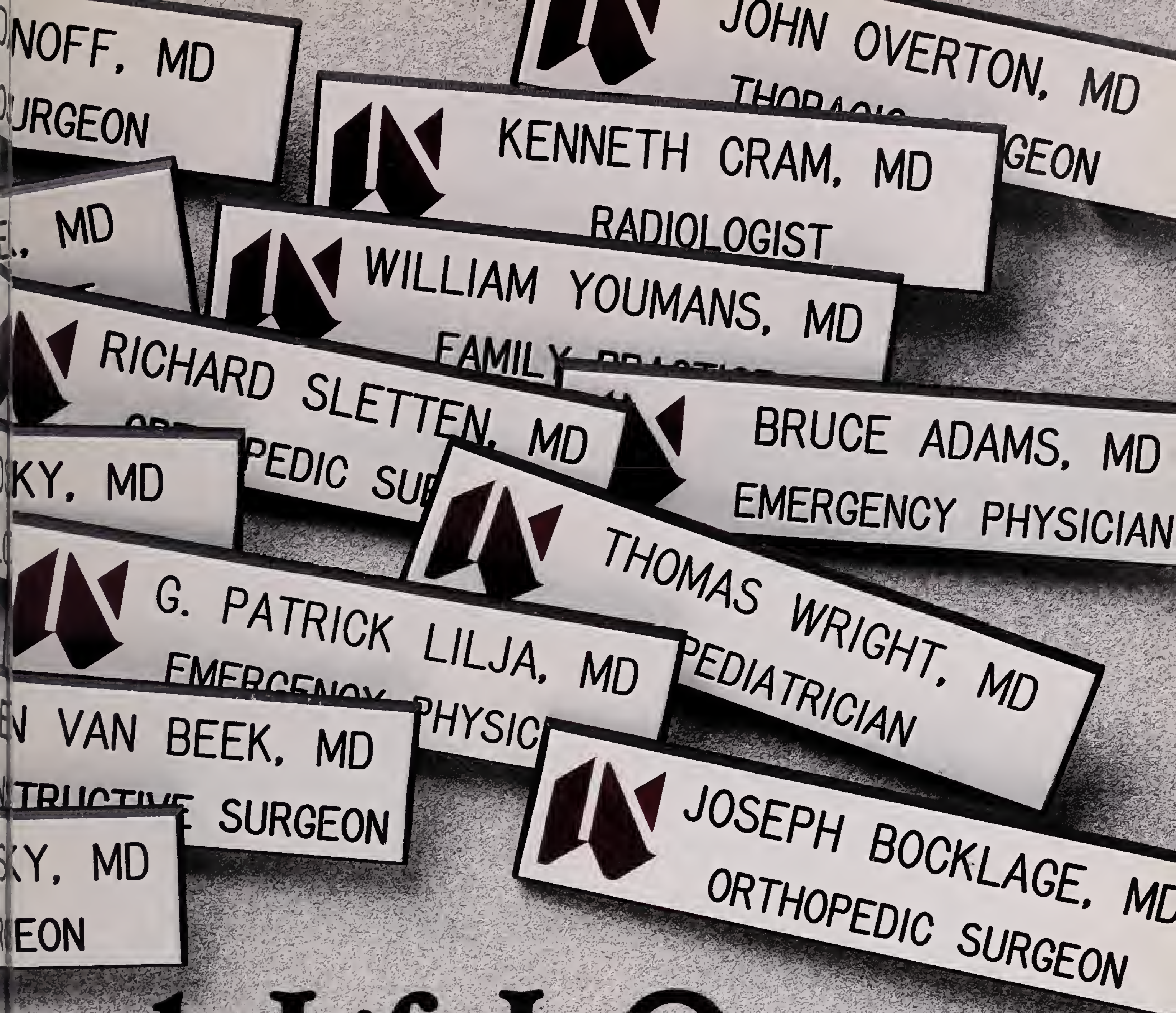
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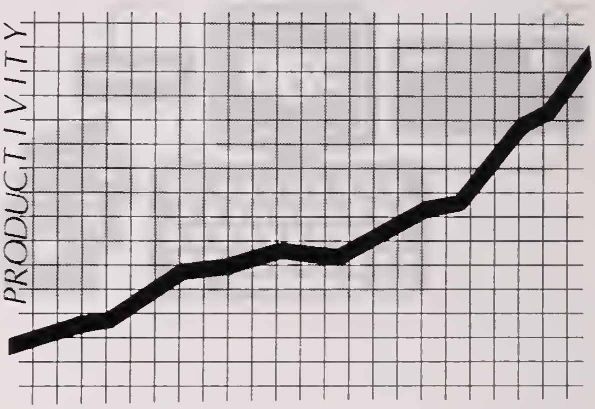

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The HMO As An Accountable and Public Institution

SOLOMON J. ZAK, M.D.
MEDICAL DIRECTOR, SHARE-MINNESOTA

An address before the American Society for Surgery of the Hand, September 13, 1985, Hyatt Regency Hotel, Minneapolis.

Ladies and Gentlemen, thank you for permitting me the time to address you on the subject of Health Maintenance Organizations. As the medical director of SHARE Health Plan of Minnesota, I will first describe our own organization and then discuss what I call a paradigm shift introduced into American, indeed contemporary society, by the HMO concept.

SHARE Health Plan was incorporated in Minnesota as a not-for-profit full-service Health Maintenance Organization August 22, 1973, under the HMO Act of 1973. As stated in its Articles of Incorporation, the primary purpose of the Health Plan is: ". . . to provide comprehensive services to enrollees either directly or through arrangements with providers . . ." SHARE was originally situated at the Samaritan Hospital in St. Paul, Minnesota, in concert with an agreement to serve, among other enrollees, employees of the Burlington-Northern Railway Company. The name SHARE is derived from the words Samaritan Hospital Association of Railroad Employees. While the eponym is no longer applicable, we at SHARE have chosen to look upon our name in a literal sense.

SHARE has contributed to Minnesotans' satisfaction with HMOs by pioneering full coverage for persons over 65 at an affordable cost, at a time when no other health plan dared to do so. In cooperation with the United States Social Security Administration, SHARE was the first HMO in Minnesota to participate in an experimental demonstration project to determine if an HMO could provide quality health care to seniors in exchange for a monthly premium paid by Medicare in place of a fee for each medical service rendered by individual medical providers. The overwhelming success of this project led to Congressional and Presidential approval of Medicare-HMO "risk contracting" on a national basis in the Tax Equity and Fiscal Responsibility Act, or TEFRA. Although we are best known for our advanced work in finding better ways to finance health care for seniors, SHARE has gone on to be a technical leader in Minnesota and nationally in developing other facets of the modern and evolving HMO. Extending from a staff-model HMO, SHARE soon adopted the notion that the best way to contain costs while involving a diversity of physicians from the medical community required a shift first to a group and then to a network model.

The founder of SHARE Health Plan and other futuristically minded directors of this small HMO appreciated its potential early on and formed SHARE Development Corporation (SDC), designed to establish similar full-service health plans throughout the United States. SHARE Development Corporation established a management contract with SHARE Health Plan and went on to establish wholly owned and managed subsidiaries in Illinois, Iowa, Nebraska, and Texas.

Because of concerns that huge, capital-rich companies were entering the HMO market, SDC's founders sought a partner with whom expertise and product synergy could be established. Thus, on September 12, 1985, the merger of SHARE Development with United HealthCare was overwhelmingly approved by the SDC shareholders. The result is the fourth largest for-profit HMO in the nation, with plans to establish 30 markets in 20 states by 1987.

My predecessor, Richard J. Webber, M.D, SHARE's first medical director (1973-1984), was a respected general surgeon until his untimely death of colon cancer in 1984. He made major contributions to the formation and philosophy of the health plan while he continued to perform general surgery. I was then asked by a search committee to serve as medical director while continuing my work as an internist-hematologist. After six months, it became clear to me that this health plan was strongly consumer-oriented and truly dedicated to providing quality health care at an unprecedented level, and I assumed my duties as medical director on a full-time basis.

HMO—A Paradigm Shift for Contemporary Society

It seriously concerns me that the fundamental feature of the HMO concept has been so often neglected by its adherents, its architects, and, especially by its antagonists. Instead, emphasis has been placed on the financial aspects of HMOs and their management. Understandably, the abject failure of the indemnification approach to the financing of health care in this country provided an important incentive to responsible public figures to seek alternative systems. This has resulted in the voluntary enrollment of almost 7% of all Americans in HMOs. Yet, very few in our society seem to be aware of the paradigm shift. Let me tell it to you. First, let us compare the indemnification approach to the HMO. The indemnifier receives dollars or premiums and is legally responsible to return dollars based on adjudicated claims in accordance with its contractural agreements filed with the insurance commissioner of its state. The HMO also receives dollars or a premium, and therein ends the similarity. By law, the HMO assumes the responsibility for the provision of health care. Thus, for the first time in our society, a legal and moral responsibility has come to reside within a public and accountable institution. This accountability for the quality of health care services has thus become a public institution.

Formerly, if there was a serious question of quality of the care a person received in this country, the only recourse that person had was to sue for malpractice. The fee-for-service system of health care in this country consequently spawned a malpractice crisis, reflecting the serious and frequent concerns that the public and the courts continue to have with the quality of medical care under the traditional system. Under this traditional system, there is no accountability. Ironically, it is this very issue that the perpetrators of the malpractice crisis have chosen as a focal point of criticism for the system that would establish accountability for the quality of health care and provide a framework for defining excellence. Indeed, this very organization, the American Society for Surgery of the Hand, is particularly devoted to excellence in its area. However, individual pursuit of excellence and the accountability of our entire profession are two different things. Thus, the paradigm shift is the establishment of an entity in our society, highly regulated and visible as it should be, that legally and morally provides accountability for the quality of the health care to humans! With this notion as a starting point, we now have an instrument that allows a more analytic approach to our adjustment from a traditionally and fundamentally flawed system, to a visible and rigorous commitment to the very highest quality of health care. It is my sincere hope that the better known protagonists of the HMO movement will articulate this paradigm shift more often, that this will not be known as an "alternative health care delivery system," and that it may serve as a model of accountability within the society for other human endeavors.

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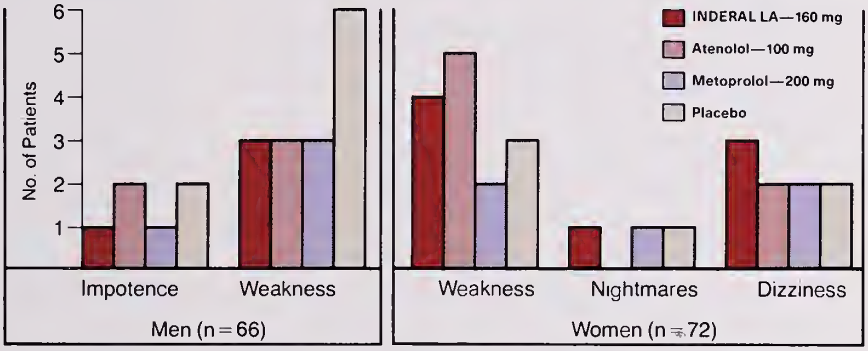

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Propranolol hydrochloride (INDERAL® LA): Propranolol is contraindicated in. 1) cardiogenic shock, 2) sinus bradycardia and greater than first degree block, 3) bronchial asthma, 4) congestive heart failure (see WARNINGS) unless the failure is secondary to a tachyarrhythmia treatable with propranolol.

Hydrochlorothiazide: Hydrochlorothiazide is contraindicated in patients with anuria or hypersensitivity to this or other sulfonamide-derived drugs.

WARNINGS

Propranolol hydrochloride (INDERAL® LA): CARDIAC FAILURE Sympathetic stimulation may be a vital component supporting circulatory function in patients with congestive heart failure, and its inhibition by beta blockade may precipitate more severe failure Although beta blockers should be avoided in overt congestive heart failure, if necessary, they can be used with close follow-up in patients with a history of failure who are well compensated, and are receiving digitalis and diuretics Beta-adrenergic blocking agents do not abolish the inotropic action of digitalis on heart muscle

IN PATIENTS WITHOUT A HISTORY OF HEART FAILURE, continued use of beta blockers can, in some cases, lead to cardiac failure Therefore, at the first sign or symptom of heart failure, the patient should be digitalized and/or treated with diuretics, and the response observed closely, or propranolol should be discontinued (gradually, if possible).

IN PATIENTS WITH ANGINA PECTORIS, there have been reports of exacerbation of angina and, in some cases, myocardial infarction following *abrupt* discontinuance of propranolol therapy Therefore, when discontinuance of propranolol is planned the dosage should be gradually reduced and the patient carefully monitored In addition, when propranolol is prescribed for angina pectoris, the patient should be cautioned against interruption or cessation of therapy without the physician's advice. If propranolol therapy is interrupted and exacerbation of angina occurs, it usually is advisable to reinstitute propranolol therapy and take other measures appropriate for the management of unstable angina pectoris. Since coronary artery disease may be unrecognized, it may be prudent to follow the above advice in patients considered at risk of having occult atherosclerotic heart disease who are given propranolol for other indications

THYROTOXICOSIS: Beta blockade may mask certain clinical signs of hyperthyroidism. Therefore, abrupt withdrawal of propranolol may be followed by an exacerbation of symptoms of hyperthyroidism, including thyroid storm Propranolol does not distort thyroid function tests.

IN PATIENTS WITH WOLFF-PARKINSON-WHITE SYNDROME, several cases have been reported in which, after propranolol, the tachycardia was replaced by a severe bradycardia requiring a demand pacemaker. In one case this resulted after an initial dose of 5 mg propranolol

MAJOR SURGERY: The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial It should be noted, however, that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)— PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS. INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes In these patients, it may be more difficult to adjust the dosage of insulin Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease In patients with renal disease, thiazides may precipitate azotemia In patients with impaired renal function, cumulative effects of the drug may develop

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL Propranolol should be used with caution in patients with impaired hepatic or renal function Propranolol is not indicated for the treatment of hypertensive emergencies

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure Patients should be told that propranolol may interfere with the glaucoma screening test Withdrawal may lead to a return of increased intraocular pressure

CLINICAL LABORATORY TESTS Elevated blood urea levels in patients with severe heart disease, elevated serum transaminase, alkaline phosphatase, lactate dehydrogenase

DRUG INTERACTIONS Patients receiving catecholamine-depleting drugs, such as reserpine, should be closely observed if propranolol is administered. The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity, which may result in hypotension, marked bradycardia, vertigo, syncopal attacks, or orthostatic hypotension

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY: Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential In 18-month studies, in both rats and mice, employing doses up to 150 mg/kg/day, there was no evidence of significant drug-induced toxicity There were no drug-related tumorigenic effects at any of the dosage levels. Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY: Pregnancy Category C. Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose There are no adequate and well-controlled studies in pregnant women Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus

NURSING MOTHERS Propranolol is excreted in human milk Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE. Safety and effectiveness in children have not been established.

Hydrochlorothiazide: GENERAL: Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals.

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely Hyponatremia, hypochloremic alkalosis, and hypokalemia Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids Medication such as digitalis may also influence serum electrolytes Warning signs irrespective of cause are Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg, increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content.

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather, appropriate therapy is water restriction, rather than administration of salt, except in rare instances when the hyponatremia is life-threatening In actual salt depletion, appropriate replacement is the therapy of choice

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy

Insulin requirements in diabetic patients may be increased, decreased, or unchanged Diabetes mellitus which has been latent may become manifest during thiazide administration

If progressive renal impairment becomes evident, consider withholding or discontinuing diuretic therapy

Thiazides may decrease serum PBI levels without signs of thyroid disturbance

Calcium excretion is decreased by thiazides Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration, have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function.

DRUG INTERACTIONS: Thiazide drugs may increase the responsiveness to tubocurarine

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient. Thiazides may decrease arterial responsiveness to norepinephrine. This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use

PREGNANCY Pregnancy Category C Thiazides cross the placental barrier and appear in cord blood The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult

NURSING MOTHERS: Thiazides appear in human milk If use of the drug is deemed essential, the patient should stop nursing

PEDIATRIC USE Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy

Cardiovascular Bradycardia, congestive heart failure, intensification of AV block, hypotension, paresthesia of hands, thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type

Central Nervous System. Lightheadedness, mental depression manifested by insomnia, lassitude, weakness, fatigue; reversible mental depression progressing to catatonia, visual disturbances, hallucinations, an acute reversible syndrome characterized by disorientation for time and place, short-term memory loss; emotional lability; slightly clouded sensorium; and decreased performance on neuropsychometrics.

Gastrointestinal. Nausea, vomiting, epigastric distress, abdominal cramping, diarrhea, constipation; mesenteric arterial thrombosis, ischemic colitis

Allergic: Pharyngitis and agranulocytosis; erythematous rash, fever combined with aching and sore throat, laryngospasm and respiratory distress

Respiratory Bronchospasm.

Hematologic: Agranulocytosis: nonthrombocytopenic purpura, thrombocytopenic purpura

Auto-Immune. In extremely rare instances, systemic lupus erythematosus has been reported

Miscellaneous. Alopecia, LE-like reactions, psoriasiform rashes, dry eyes, male impotence; and Peyronie's disease have been reported rarely Oculomucocutaneous reactions involving the skin, serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol

Hydrochlorothiazide:

Gastrointestinal Anorexia, gastric irritation, nausea, vomiting, cramping, diarrhea, constipation, jaundice (intrahepatic cholestatic jaundice); pancreatitis, sialadenitis

Central Nervous System Dizziness, vertigo; paresthesias, headache, xanthopsia

Hematologic: Leukopenia, agranulocytosis, thrombocytopenia, aplastic anemia

Cardiovascular Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).

Hypersensitivity Purpura photosensitivity, rash, urticaria, necrotizing angiitis (vasculitis, cutaneous vasculitis); fever, respiratory distress, including pneumonitis; anaphylactic reactions

Other Hyperglycemia, glycosuria, hyperuricemia, muscle spasm; weakness, restlessness, transient blurred vision

Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

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REFERENCE:

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Update on Imaging Techniques in the Evaluation of the Female Breast

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Mammography has become the cornerstone of radiologic evaluation of the breast. In the past decade, mammographic technique and the amount of radiation required have been greatly improved. The radiation dose is now thought to be low enough to justify mammographic screening. Proper equipment is important. Ultrasound, another technique being used to evaluate the female breast, has a definite place in helping to determine whether breast masses are cystic or solid. Computed tomographic mammography can occasionally be used to localize lesions otherwise visible in only one view of the mammogram. Magnetic resonance imaging, transillumination light scanning, and thermography are experimental techniques in evaluation of the breast.

Breast cancer affects more American women than any other cancer. Together with lung cancer, it is the leading cause of cancer death in American women. The mortality from breast cancer has not changed significantly over the past 50 years.[1]

Since its gradual acceptance by the medical community in the 1960s, mammography has become the cornerstone of radiologic evaluation of the breast. Because it is far from perfect, both in sensitivity and in specificity, much effort has been directed toward improving mammographic techniques and investigating other imaging methods that might replace or complement it. Another reason for the search for new techniques has been concern about the radiation dosage necessary with mammography. Mammography became widely used in the middle 1970s in response to the breast cancers experienced by Betty Ford and Happy Rockefeller. Then a scare about the possible danger from radiation exposure greatly lessened the demand for mammography.[2]

Considerable confusion exists today about the clinical usefulness of the methods available for evaluating the breast. The purpose of this article is to briefly review the place these various methods hold in the evaluation of the female breast.

Mammography

Mammography is the primary modality for the radiologic evaluation of the breast. There are two major techniques — xeromammography and film-screen mammography. A recent renewal of interest in film-screen mammography has led to a decrease in interest in xeromammography. When both techniques are done with technical expertise, the results should be very similar. Both are equally capable of detecting calcifications and noncalcified cancers, even very small ones. A major difference in the two techniques is the amount of radiation required. "Film-screen" mammography means that, in addition to an X-ray film, an intensifying screen is used to decrease the necessity for large amounts of radiation. Thus, film-screen mammography requires a significantly smaller dose to the middle of the breast and, therefore, has an advantage over xeromammography. If done properly, however, xeromammography does not result in a dose so high that it must be totally excluded from use.

Because dosage considerations are important, the following figures from the fourth-year experience of the Breast Cancer Detection Demonstration Projects (BCDDP) are given.[3] For film-screen mammography, the average skin exposure per view was 580 mR. The average skin exposure for each xeromammographic view was 1,100 mR. "R" stands for roentgen, which is a measure of exposure at the skin level, and mR is 1/1000 R. Of more importance is the midbreast dose. Radiation dosages are expressed in terms of rads. For simplified purposes, 1 rad is equivalent to 1 roentgen. For film-screen systems, the average midbreast dose was 41 mrad per view. The midbreast dose average for xeromammography was 350 mrad per view. For diagnosis, both these dosage levels are acceptable, but for screening, the lowest dose possible is the most desirable; therefore, film-screen mammography has the edge as a screening examination (see addendum p. 578).

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Radiographic technique is critical if high-quality images are to be obtained. If film-screen mammography is used, a dedicated mammography unit is absolutely recommended. If xeromammography is to be done, good images can be obtained without a dedicated mammography unit, although the images are likely to be better if such a unit is used. Mammography is a very specialized technique that is best done in the radiologist's office or in a hospital. Radiologists should have good equipment, and it is recommended that referring physicians make sure they are sending patients to a radiologist who uses up-to-date techniques.

Dedicated mammography units are available from a number of manufacturers. Some specific features about these units are very important.[4] One factor is effective compression of the breast during the examination. All clinicians should realize that compression is essential in good mammography. Patients who complain about compression should be told that compression allows a much more reliable examination. We, as radiologists, try to make the examination not actually painful for patients, but sometimes it is impossible to avoid some discomfort. If women know what to expect, they will more easily tolerate the examination.

Ultrasound

Ultrasound is not recommended as a screening technique for breast cancer, because it cannot detect the microcalcifications that are so often associated with nonpalpable breast cancers. Also, how reliable ultrasound is in detecting some of the very tiny cancers that can be detected by mammography is uncertain at this time.[16,17] On the other hand, ultrasound has a place in the evaluation of breasts posing a diagnostic problem.[18-20] The current state-of-the-art breast ultrasound examination differentiates solid from cystic characteristics of breast masses.

It is recommended that state-of-the-art equipment for small-parts ultrasound be used for breast evaluation; transducers should be in the 7.5 to 10 MHz range. Small-parts ultrasound is useful in differentiating cystic from solid lesions. This differentiation is best confined to palpable breast lesions because of spatial orientation problems with nonpalpable lesions. With whole-breast scanners, better spatial orientation can be obtained; therefore, cystic and solid characteristics might be adequately differentiated even for nonpalpable lesions of the breast.

Ultrasound, therefore, should be considered supplementary to mammography. Ultrasound can add meaningful diagnostic information in some situations, including the following: (1) Differentiation of solid lesions from cystic lesions in patients with palpable breast masses; (2) Differentiation of solid lesions from cystic lesions in patients with nonpalpable mammographic masses. This is most reliably done with a dedicated whole-breast ultrasound machine. It can be a problem with a small-parts ultrasound machine; (3) A symptomatic area in the breast that shows only uniformly dense fibroglandular tissue on mammography.[21]

Ultrasound should not be relied on to distinguish between solid benign masses and solid malignant masses. It can be used as an aid for puncturing such masses.[18]

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) must be considered an experimental technique. Currently, MRI can only be justified for imaging the female breast when it is done experimentally and at no charge to the patient. Further studies are needed to evaluate its place in breast lesion diagnosis. Because of the high cost of MRI, it is difficult to foresee that this technique could be of any value in screening for breast cancer. Possibly, it may help in differentiating benign from malignant lesions. Some studies have shown the potential value of MRI.[5,6]

Transillumination Light Scanning

Transillumination light scanning was once called "diaphanography," a term that is becoming outdated. The place of transillumination light scanning in breast lesion diagnosis has not been established. The technique is being used in many institutions around the country. Much of the use is an attempt to try to establish its role. Reports on the efficacy of transillumination light scanning have been mixed.[7,8] It is believed that use of this technique should be experimental only and that patients should not be charged for this study. More testing is needed in which this method is compared with mammography and physical examination.

Thermography

Thermography was once used fairly extensively, most often in the form of telethermography. Examination involved a machine that detected infrared heat coming from the patient. Liquid crystal thermography has become much more widely used in recent years, and its use is being pushed by commercial firms. Sales pressure is directed primarily at primary care physicians, namely, internists, family physicians, and obstetricians. Commercial firms are no longer putting primary sales pressure on radiologists, because they correctly believe that most of the radiology community has been disaffected by published results on thermography. The major problem is one not of instrumentation but of physiology. Results from the BCDDP[9,10] and results from the Mayo Clinic (unpublished) both show that thermography is only as effective as a coin flip in the overall evaluation of patients with breast cancer. Results from the Mayo Clinic showed that 18% of all women having thermograms had a positive result. Twenty percent of women who had a benign lesion removed had a positive thermogram. Forty-five percent of women who had a malignant lesion removed had a positive thermogram. Analysis of the results for malignancy showed that when the cancer was 1 cm or less in size, only 25% of women had a positive thermogram. This increased to 36% when the tumor was between 1 and 2 cm in size. Of women with cancers that measured between 2 and 3 cm, 56% had a positive thermogram. Sixty-five percent of women who had cancers 3 cm or greater in size had a positive thermogram.

The main emphasis is now being placed on the use of thermography as a risk indicator. Some studies have shown that if a women has a positive thermogram today, breast cancer is very likely to develop sometime in the next 5 to 10 years.[11] This is the justification that is stressed for use of thermography at this time. It is hard to believe that this could be true when one considers how many women who have breast cancer have negative thermograms.

Thermography is not recommended as a screening device or as a diagnostic test. Its only justified use is as an experimental device to compare the results with those of mammography.

Computed Tomographic Mammography

Clinical trials of machines specifically devoted to breast evaluation using the principles of computed tomography (CT) were carried out in the 1970s.[12,13] These showed that there was some potential for the technique, but there were also many problems. The recommendation at that time was for further clinical trials. The company that manufactured the machines decided not to pursue the technique further.

There is a place for breast evaluation with CT body scanners. In some cases, a nonpalpable lesion is seen on the oblique view of the mammogram and not on the craniocaudad view, and the lesion is suspicious enough to require localization and biopsy. Because preoperative localization should not be done on the basis of one view, use of a CT body scanner has been an effective way to localize these lesions.[14,15] This is a technique that should be kept in mind when a lesion is difficult to localize.

Overall Evaluation

For breast evaluation, primary emphasis must be placed on doing state-of-the-art mammography. None of the other techniques available should ever be used unless it is done concurrently with mammography. Mammography should always be done in conjunction with a current physical examination.

When screening mammography is carried out, nonpalpable breast lesions will be detected. It is important that preoperative invasive localization procedures be done to help the surgeon find the nonpalpable lesions. A number of techniques have been described in the radiologic literature, and different radiologists may use different varieties of localization procedures.[22] By far the most common one used today is a combination needle and hooked wire technique. A needle is inserted into the breast. When it is properly placed in reference to the nonpalpable lesion, as shown by a repeat mammogram with the needle in place, the needle is pulled out and a small hooked wire is left in the same position. The surgeon can then cut down along the hooked wire until reaching the proper area.

The wording of interpretation for mammograms is very important if patients are to be properly cared for. Wording has been a delicate matter in the past, and it remains so because some referring physicians and surgeons object to having specific directions given to them about their patients. We radiologists very strongly believe that we have the responsibility to give specific directions about what we think should be done for the patient. When a biopsy is indicated on mammographic grounds, if we do not say so, a biopsy may not be done. It is recommended that radiologists and referring physicians hold meaningful discussions about mammographic results.

Screening mammography is becoming commonplace. The American Cancer Society has laid down guidelines for screening for breast cancer.[23,24] These guidelines are endorsed by the American College of Radiology:[25] (1) Women 20 years of age and older should perform breast self-examination every month; (2) Women ages 20 through 40 should have a physical examination of the breast every 3 years; (3) Women over age 40 should have a physical examination of the breast every year; (4)

Women between the ages of 35 and 40 should have a baseline mammogram; (5) Women between the ages of 40 and 50 should have mammography every one or two years; (6) Women over age 50 should have a mammogram every year when feasible; (7) Women with personal or family histories of breast cancer should consult their physician about the need for more frequent examinations.

Apart from mammography and physical examination, no techniques are considered desirable for screening. This specifically means that we cannot at this point recommend that thermography, transillumination light scanning, or ultrasound be used for screening.

The three major characteristics of a good screening method are that (1) it has a high sensitivity, (2) it is relatively harmless and thus has a high benefit-to-risk ratio, and (3) it costs as little as possible. If state-of-the-art mammography is done, a sensitivity of about 90% should be achieved. The current benefit-to-risk ratio is thought to be very positive in view of the low dose necessary to do mammography, particularly film-screen mammography. The matter of cost is one that we radiologists are going to have to wrestle with further. Many people believe that if screening is to become commonplace, the cost of mammography must be reduced significantly. This is a challenge for the American radiologist.

It must be remembered that screening and diagnosis are two different events. Screening is aimed at detecting abnormalities. Diagnosis involves further evaluation of these abnormalities, if necessary, and an attempt to arrive at a more definitive diagnosis. Screening can, we hope, be done at low cost, and then if further diagnostic studies are necessary, additional charges will have to be made for them.

Two facts must never be forgotten by physicians who order mammograms for their patients: (1) Mammography can detect many lesions that are not palpable; (2) A negative mammogram report should never cause the cancellation of a biopsy for a lesion that is clinically worrisome for cancer. Mammography is not perfect, and even clinically obvious lesions can be missed with this technique.

Addendum

Earlier this year, a new X-ray film was introduced that allows a significant reduction in the dose required for state-of-the-art film-screen mammography. The amount of radiation required for such imaging is now approximately one-half what it was at the time this paper was submitted for publication. Thus, the benefit-to-risk ratio of film-screen mammography is further enhanced.

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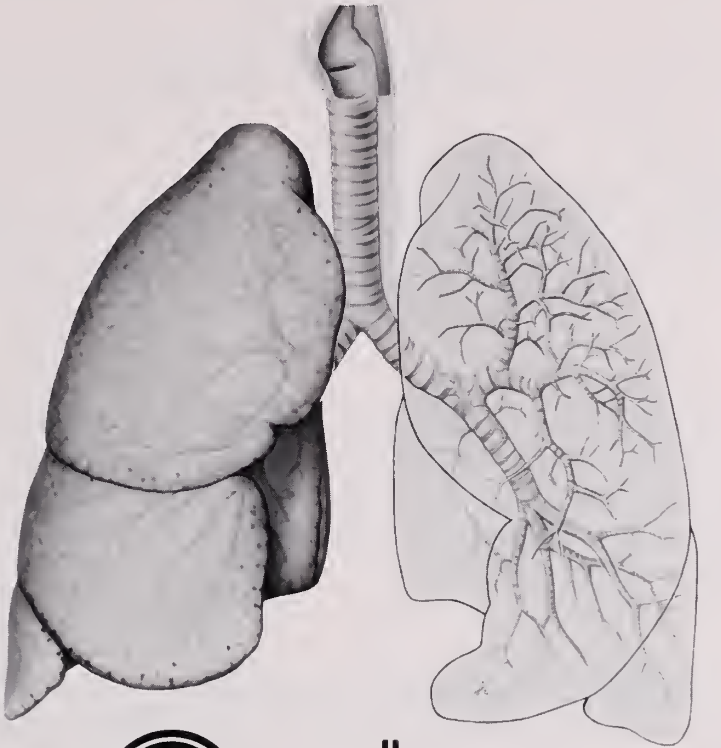

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- Hypersensitivity reactions (including morbilliform eruptions, pruritus, urticaria, erythema multiforme, serum-sickness-like reactions): 1.5%; usually subside within a few days after cessation of therapy. These reactions have been reported more frequently in children than in adults and have usually occurred during or following a second course of therapy with Ceclor. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.
- Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.
- Other: eosinophilia, 2%; genital pruritus or vaginitis, less than 1%.

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- Slight elevations in hepatic enzymes.
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A Mobile Cancer Clinic:

An Effective, Safe, and Inexpensive Method of Delivering Anti-Tumor Therapy

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To assess the feasibility of providing active cancer treatment to patients in their home, a mobile van was equipped for making home visits. Equipment included a centrifuge, microscope, and a hood for preparing nutritional and chemotherapeutic agents. Weekly visits were made by a medical oncologist and an oncology nurse specialist. A total of 149 patient visits were made during the initial six months of operation. Care consisted of supportive measures, enteral or parenteral nutritional therapy, and continuous infusion or intermittent chemotherapy. All patients preferred home care to frequent office visits or hospitalization. Eight of 31 patients significantly improved their performance status, allowing them to return to the doctor's office for further therapy. There were no serious complications. Mild complications included fluid overload secondary to hyperalimentation and chemotherapy-induced nausea. The total cost of the program to the patients was $32,000. The projected cost of similar care administered in either the hospital and/or outpatient department was $57,000. We feel this program demonstrates patient preferability, effectiveness, safety, and cost reduction of delivering treatment to oncology patients at home. Escalating costs of traditional medical care, DRGs, and technologic advancements that make ambulatory therapy more feasible make it more likely that such home care will become a reasonable alternative/adjunct to traditional medical care.

Many cancer patients go through periods of time when they are incapacitated by severe pain, intractable nausea and vomiting, profound cachexia, and physical debility. Traditional medical care imposes further hardship on the patient as it entails physically uncomfortable travel to the physician's office, ambulance and/or Medi-van expenses, time lost from work for family members, frequent emergency room visits, and/or prolonged hospitalizations.

In an attempt to provide continued active treatment with less associated discomfort to this particular group of patients, a group of medical oncologists instituted a Mobile Home Cancer Clinic, The Care Van.

Materials and Methods

In December 1983, a group of four medical oncologists purchased and equipped a Ford Econoline van with a centrifuge and microscope for performing complete blood counts (CBC) and a hood for preparing chemotherapeutic agents.

Patients were selected as candidates for home care if they lived within a ten mile radius of the hospital and if they met one or more of the following criteria: (1) Travel to and from the doctor's office was difficult because of either physical infirmity or social restrictions, (2) aggressive treatment was planned that would otherwise have required hospitalization, or (3) palliative and/or supportive care was indicated.

Total parenteral nutrition (TPN) was administered as an adjunct to chemotherapy when there was: (1) Malfunction of a portion of the alimentary tract, (2) severe mucositis, nausea or vomiting, or weight loss, or (3) general physical debilitation that would have precluded further therapy. Nutritional support was continued until pretreatment weights were approximated, a sense of well-being was restored, or chemotherapy was terminated.

Permanent and/or temporary long-dwell catheters were placed either intravenously or intra-arterially prior to the institution of home care when parenteral therapy was anticipated.

Visits were made to the patients by both a medical oncologist and an oncology nurse specialist on a schedule determined by the individual needs of the patient and type of therapy employed. Daily visits were made by VNA (Visiting Nurse Association) nurses when indicated.

CBCs were performed in the van prior to each course of chemotherapy until counts remained stable on standard doses of therapy and then were run routinely, along with blood chemistries, on return back to the office.

Anti-emetics and hydration were provided with each course of therapy according to standards used for the administration of these drugs in the outpatient or hospital setting.

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Continuous infusions were administered via either IVAC, IMED, CORMED, or AUTO SYRINGE (Trevenol Labs) infusion systems.

The van was purchased and equipped for approximately $15,000. The cost of the infusion systems purchased was approximately $7,500. An average of $50 was spent weekly for mileage and maintenance of the van. This resulted in an investment of less than $25,000 for the purchase and operation of the mobile clinic for the first six months of its existence.

The physician making the home visits saw half the number of patients seen by the physician remaining in clinic on any particular afternoon. No additional nursing fees were accrued, as the nurse who would have ordinarily remained in clinic accompanied the physician on his home visits.

Patients were charged $120 for the initial home visit as this was considered to be a consultation visit; subsequent visits were $55 each. The daily rental fee for the various infusion systems employed was $35 per day.

In contrast, traditional care expenses would have included: (1) Transportation fees to and from the clinic and/or hospital amounting to $75-$175 depending on the type of transportation employed and distance traveled; (2) the daily cost of a hospital bed, approximately $200; (3) the initial physician's fee of $120; and (4) daily physician hospital visits which are $35 per day. Laboratory and pharmaceutical costs were similar for patients at home and in the hospital or clinic setting.

Projected costs to the patient not seen at home were calculated by assuming that all patients needed Medi-van transportation to and from the clinic and/or hospital because of their nonambulatory status. This alleviated the need to calculate the cost of time off work for family members who might in fact have brought the patient into clinic. This expense was added to the daily hospital costs, physician visit fees, daily cost of the drugs administered, infusion system rentals, and the lab work performed.

Results

A summary of patients according to age, sex, type of malignancy, and modes of therapy administered are listed in Table 1. There were 20 female and 11 male patients, with an age range of 46 to 94 years of age. The majority of patients had either breast, lung, or a GI malignancy.

Fifteen patients received chemotherapy, eight patients received hyperalimentation, and three patients received both. Eleven patients received predominantly supportive care. The most commonly administered chemotherapeutic agents were cyclophosphamide (CTX), methotrexate (MTX), and 5-fluorouracil (5-FU) (CMF), doxorubicin (ADR) and vincristine (VCR). More toxic drugs such as cis-platin (C-DDP) and etoposide (VP-16) were administered on one occasion to a patient with metastatic small cell carcinoma of the lung, and three-day continuous infusions of vinblastine were administered to two patients with metastatic breast cancer. One patient with squamous cell carcinoma of the lung and refractory hypercalcemia received three intravenous doses of mithramycin just prior to his death. The last four drugs have not previously been reported to have been administered at home to our knowledge.

No major complications have been encountered thus far. Three patients who received TPN developed mild fluid overload requiring diuresis. Nausea was minimal. Catheter-related infection and/or thrombosis did not occur.

Of the original 31 patients, 10 patients are still visited by the Care Van, 8 patients have improved to a sufficient degree as to be able to receive their further treatments in the clinic, 3 patients have chosen to discontinue treatment of any kind, and 10 are now deceased.

In the initial six months of operation, the total cost of home care to the patient was approximately $32,000. The total projected costs had the same therapy been administered in either the clinic or hospital setting, amounted to approximately $57,000 (Tables 2 and 3). Although this resulted in a considerable savings to the patients, the net cost to the physicians has yet to be calculated. This may be difficult to calculate because of offsetting benefits such as increased numbers of referrals it may have generated, revenue generated by the rental of the infusion systems and the cost of treating patients who might ordinarily have gone untreated. Over what amount of time this alternative method of health care administration might become cost effective to the physicians is yet to be determined.

Discussion

To the best of our knowledge, our program represents the first home oncology program to provide *aggressive* therapy to patients in their own homes. Other programs have centered primarily around patients who have failed standard chemotherapy, although palliative chemotherapy was pro-

TABLE 1

Patient Profiles

Age	*Sex*	*Diagnosis*	*# Visits*	*Chemotherapy*	*Nutritional Rx*	*Supportive Care*
75	M	Chondrosarcoma	1	—	—	+
55	M	Glioblastoma	1	—	—	+
64	F	Breast cancer	9	Vinblastine infusion	TPN	–
60	F	Glioblastoma	3	—	—	+
95	F	Thrombocythemia	5	Hydroxyurea	—	–
66	F	Pancreatic cancer	1	IV 5-FU	—	–
49	F	Lung cancer, non-small cell	7	—	TPN	–
85	F	Chronic lymphocytic leukemia	7	Leukeran, Prednisone	—	–
58	M	Mixed lymphoma	3	—	TPN	–
67	F	Glioblastoma	5	—	—	+
69	M	Lung cancer, non-small cell	3	CTX, ADR, MTX, Procarbazine	TPN	–
79	F	Gastric cancer	2	—	—	+
80	F	Breast cancer	7	5-FU, MTX, VCR	—	–
82	F	Breast cancer	6	5-FU, MTX	—	–
71	M	Small cell cancer of lung	15	c-DDP, VP-16	TPN	–
84	F	Breast cancer	13	CTX, MTX, 5-FU	—	–
68	F	Small cell cancer of lung	15	—	TPN	–
83	F	Ampullary cancer	25	5-FU, ADR	—	–
68	M	Lung cancer, non-small cell	4	Mithramycin	—	–
64	F	Breast cancer	2	CTX, 5-FU, MTX	—	–
63	F	Breast cancer	3	—	—	+
84	F	Adenocarcinoma, unknown primary	4	5-FU, Mitomycin, ADR, VCR, MTX	—	–
46	F	Hypernephroma	1	ADR, VCR	—	–
72	M	Colon cancer	2	5-FU	—	–
60	F	Small cell cancer of lung	2	5-FU	—	–
62	F	Breast cancer	1	CTX, MTX, 5-FU	—	–
64	M	Head and neck cancer	4	—	TPN External	–
58	M	Leiomyosarcoma	2	Intrahepatic ADR	—	–
45	F	Breast cancer	1	Vinblastine infusion	—	–
62	M	Lung cancer, non-small cell	1	IT, MTX	—	–
63	M	G-E junction cancer	7	—	TPN	–

vided in a few instances.[2] We feel that several points about our program need to be emphasized.

Perhaps most important, our program allowed us to *actively* treat patients who might formerly have been labeled as terminal once they became nonambulatory. We were able to demonstrate an improvement in performance status in 8 of 31 patients, which allowed them to continue their treatment courses in the outpatient setting.

Second, active oncologic treatment can be provided more humanely in the home setting. Home visits obviated the need for frequent, and often times uncomfortable, rides to and from the clinic. Prolonged hospital stays were avoided by continuous infusions of chemotherapy and TPN at home via portable infusion systems. Side effects such as nausea and pain seemed to be reduced, in part, by the familiar setting in which the therapy was administered.

Third, the relative lack of serious complications such as catheter-related infections and thromboses, pump malfunctions, etc., suggest that this is a safe method of health care delivery. By keeping patients at home, nosocomial infections and other iatrogenic complications were avoided.

Finally, we demonstrated a considerable savings to the patients by this means of health care delivery. Our results compare with other reports in the literature that have demonstrated cost reductions for home nutrition programs[3] and home intravenous antibiotic therapy programs.[4] Cost reduction is a particularly attractive incentive for home care as the cost of traditional medical care escalates and Diagnostic Related Groups (DRG) legislation takes effect. The development of newer therapeutic delivery systems promises to further expand home care and thereby hold down medical expenditures.

Currently there are numerous commercial agencies in existence that provide some of the functions discussed above (e.g., TPN, chemotherapy, etc.). However, a crucial ingredient for effective care — strict physician-patient contact — has largely been missing from these agencies. Direct physician input results in more comprehensive care for both patients with treatable disease and those that require only palliative care. This also provides psychological reassurance (especially in the case of

TABLE 2

Individual Expenditures

	TPN		*Chemotherapy*		*General Care*	
	Projected	*Van*	*Projected*	*Van*	*Projected*	*Van*
1.					267.00	147.00
2.					230.00	110.00
3.	3,541.00	1,891.00	988.00	383.00		
4.					714.00	296.00
5.					881.00	585.00
6.					274.00	238.00
7.	1,137.00	567.00			422.00	227.00
8.					1,150.00	724.00
9.	1,620.00	592.00				
10.					1,108.00	392.00
11.	2,556.00	1,266.00	640.00	510.00		
12.					434.00	165.00
13.			1,238.00	877.00		
14.			1,247.00	859.00		
15.	9,840.00	4,895.00	2,860.00	1,160.00		
16.			3,810.00	2,835.00		
17.	8,220.00	4,350.00				
18.			3,236.00	1,835.00		
19.			1,004.00	799.00		
20.			285.00	249.00		
21.			763.00	532.00		
22.			1,389.00	1,158.00		
23.			428.00	392.00		
24.			414.00	313.00		
25.					230.00	110.00
26.					230.00	110.00
27.	1,586.00	862.00				
28.			1,336.00	766.00		
29.			988.00	383.00		
30.			247.00	211.00		
31.	2,652.00	1,362.00				

Projected = Hospital Costs

TABLE 3

Total Expenditures

Type of Care	*Home Care Costs*	*Traditional Costs*
General Care	$ 3,104	$ 5,940
Chemotherapy	13,262	20,875
TPN	15,785	30,694
Totals	$32,151	$57,509

terminally ill patients) that the physician is still involved in their care.

Physician-based programs such as the one described above, may have significant impact on the way in which medicine is practiced in the near future. Home ventilatory therapy is currently being evaluated for patients with chronic pulmonary[5] and neuromuscular[6] disorders, and appears to be safe, less costly, and more satisfactory to patients and their families. Home parenteral alimentation programs for patients with chronic malfunction of their gastrointestinal tracts has become the treatment of choice for restoring an adequate nutritional status to these patients.[7] Home intravenous antibiotics for patients with chronic bacterial and/or fungal infections such as SBE and osteomyelitis, following initial stabilization in the hospital, may well become the treatment of choice for these disorders as well.

In conclusion, our program seems to confirm other reports in the literature that home treatment programs are safe, effective, and less costly to patients in terms of physical discomfort and finances. The outlook for this mode of therapeutic delivery appears extremely favorable, although additional study will be needed to exactly define its future role in the practice of medicine.

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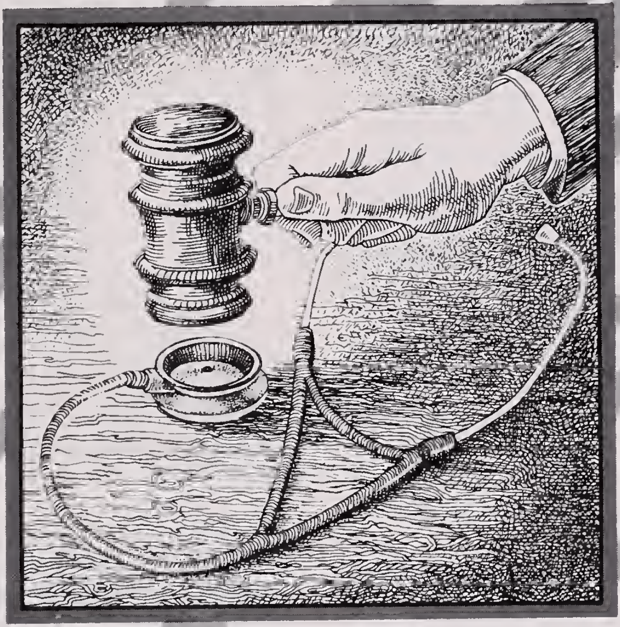

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Accidental Poisoning in Minnesota

Mortality Data

DEBRA KAY OLSON, R.N., M.P.H.*

An archival study to describe the incidence of death due to accidental poisoning in Minnesota'a population was initiated in cooperation with the Minnesota Center for Health Statistics and the Minnesota Poison Control System. Mortality data from 1970 to 1982 were assessed to identify agent, host, and environmental factors associated with this injury. During the study years, the rate of accidental poisoning death per 100,000 population decreased from 3.5 in 1970 to 1.9 in 1982. The 25- to 44-year-olds experience the greatest number of these deaths. Male-to-female ratio is 2:1, and divorced residents experience a 2 times greater risk of death than any other marital group. The Indian and black populations experience 9 to 10 times greater risk than the white residents. Accidental poisoning deaths peak in winter and occur most often in the home environment. Of substances involved, exhaust gas from vehicles not in transit accounted for 58% of the total in 1980.

The basic premise of epidemiology is that disease, or in this case injury, does not occur randomly but in patterns that reflect the operation of the underlying causes. A knowledge of these patterns is not only of value for predicting future occurrence, but also can help us understand causation and thus aid us in developing methods of control and prevention.

The essential first step is to describe accurately poisoning occurrence in Minnesota's population. Basic data to be collected include the following variables: person (e.g., sex, age, race), place (e.g., county, rural or urban residence), and time (e.g., day, month, season). A better understanding of poisoning injury can be determined by identifying these variables and the patterns they follow. Three classes of contributing factors are used to organize these variables: agent, host, and environment.

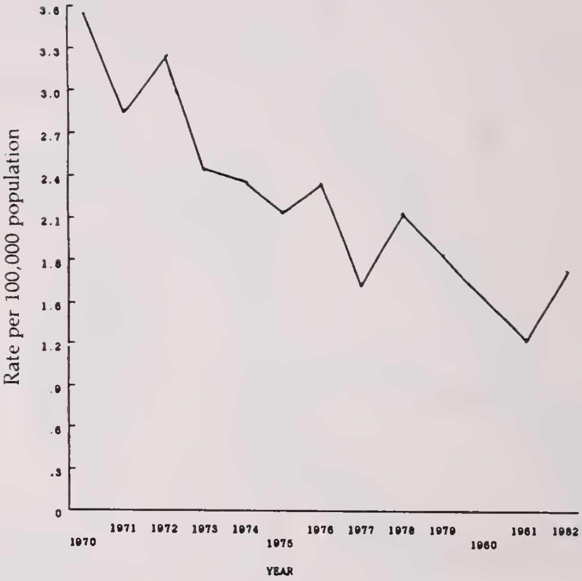

Figure 1 - Trends: accidental poisoning death rates, Minnesota, 1970-1982.

In this data summary, accidental[1]* deaths associated with poisoning in Minnesota will be investigated for the years 1970 to 1982. Trends in accidental poisoning death rates (Figure 1) have shown a decline in this decade, but the need to identify the variables associated with this injury remains.

Data Sources

Death certificates are the source documents of deaths of Minnesota residents. Death certificates are usually completed by hospital personnel, physicians, and funeral directors. Only those certificates relating poisoning as an underlying cause of death are investigated for this report. Population data used in this report for 1970 and 1980 were collected through the Census of Population and Housing. Age-specific population data available between census years are based on estimates from the state demographer's office. Due to differences in reporting criteria and ICD codes prior to 1979, specific comparisons on cause of death will be made only for the last four years of available data, 1979 to 1982.

Comparisons made with the latest available national data (1980) have been tabulated from the National Center for Health Statistics report which collects information from the state registrars of vital statistics. Only deaths of residents occurring within the United States are included.

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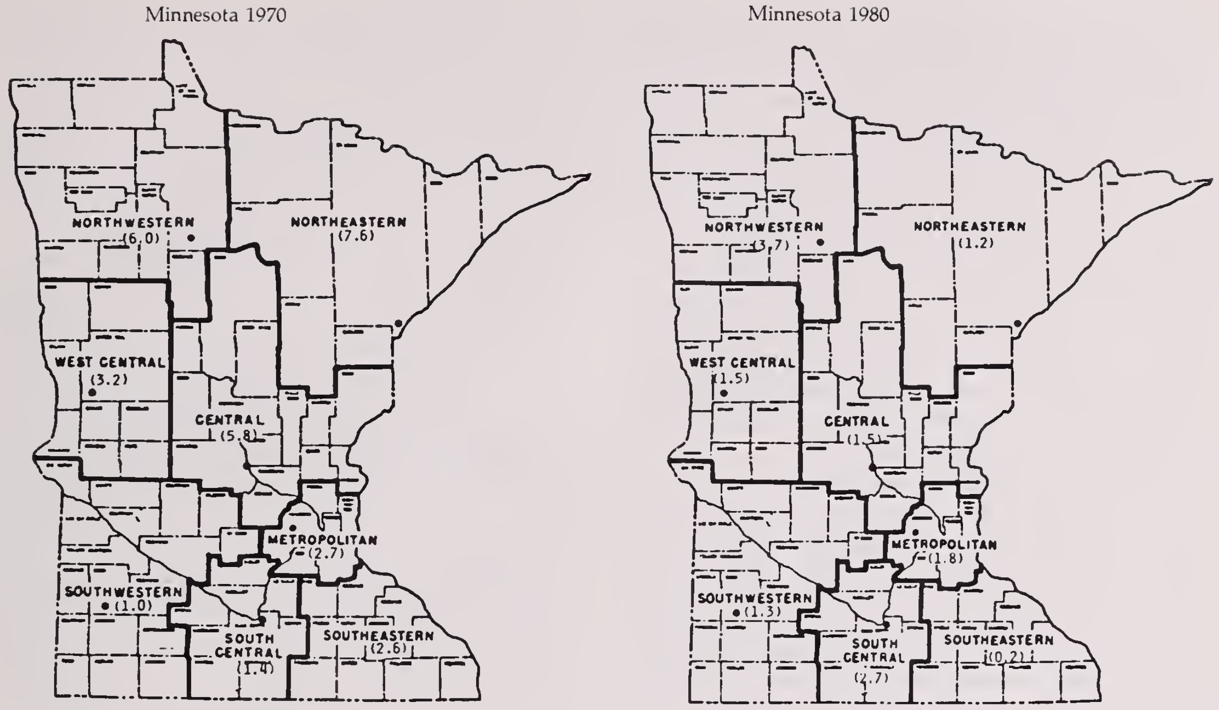
[1] *Accident refers to that occurrence in a sequence of events that usually produces unintended injury, death, or property damage. The term accident is used here for purposes of public clarity only. Accident is not used to denote a chance happening but, rather, an unintentional injury—an event whose predisposing factors can be identified, analyzed, and controlled.



Minnesota 1970

Minnesota 1980

*rate per 100,000 population

Figure 2 - Accidental poisoning death rates by health planning region, Minnesota.

Data Quality

The quality of mortality data is directly related to the completeness and accuracy of the information contained on the death certificates. The Minnesota Department of Health (MDH), maintains two major programs related to improving quality of information received on certificates. The Query program is a follow-back with hospital personnel, funeral directors, and/or physicians concerning incomplete or conflicting information. The Field program conducts seminars and site visits designed to educate the participants in the vital registration system.

Environmental Factors

The environment, pertinent to the epidemiological model of agent-host-environment, includes everything external to the agent and the human host(s). Environmental factors that may affect the injury outcome are viewed within three classes: physical, biological, and socioeconomic. The variables examined in the environment section of this report influence all three classes.

County

County, as relates to poisoning death, is tabulated three ways: county of residence of deceased, county of death occurrence, and county of accident.

County of accident is most relevant when one considers prevention strategies aimed at the geographic environment. These data consider all individuals, regardless of residence. The primary factor is where the accident took place. Figure 2 shows the death rates due to poisoning incidents by health planning region for 1970 and 1980.

A significant change appears in the northeast region where there was a decline from a rate of 7.6 per 100,000 population in 1970 to a rate of 1.2 in 1980. The northwest region continued to experience a high rate of accidental poisoning deaths, moving from second (rate of 6.0 in 1970) to first (rate of 3.7 in 1980) in rank order of regions. Within the metro region, Hennepin County (rates 2.9 in 1970 and 2.1 in 1980) and Ramsey County (rates of 2.5 in 1970 and 2.4 in 1980) showed little change. (All mortality data reported for Minnesota are standardized using accident occurrence totals throughout the remainder of this report.)

Season

Season refers to the usual conditions of weather during certain parts of the year that follow a regular predictable annual cycle. Season is thought to affect injury indirectly by influencing human habits and customs, which operate to increase or decrease exposure to particular etiologic factors.

Winter consistently presents the greatest number of accidental poisoning deaths in Minnesota as well as the nation as a whole. This seasonal trend is due almost entirely to poisoning by gas. In 1979 (latest detailed data available), 43% of all accidental poisoning deaths by gas in the U.S. took place in winter, while poison deaths by solids and liquids were evenly distributed throughout the year. Minnesota seasonal trends for poisoning deaths by gas are similar to national trends, but deaths by solids and liquids peak in summer months.

Compared to other accidental deaths in Minnesota, seasonal trends in poisoning deaths most closely resemble seasonal trends in accidental deaths by fire. The incidence of death by fires and poisons drops in the summer months and peaks in the winter. This is the opposite of most other injury types (motor vehicle accidents, falls, drownings, and food ingestions) which present a peak of accident deaths in summer months and a decline in winter.

Location

Nationally, home poisoning accidents accounted for 1.3 deaths per 100,000 population (3,100 deaths) in 1982. Minnesota presented a similar 1982 rate of 1.1 home poisoning deaths per 100,000 population. In 1982, the largest percentage of poison-related deaths (60%) in Minnesota occurred in the home, just 3% occurred in the workplace, and 37% were public nonmotor vehicle related.

Host Factors

The host refers to the person, or group of people, who are susceptible to injury. Outcomes of the host-agent interaction are, in part, dependent on biological and behavioral characteristics of the host.

Age

The over 65 age group experienced an increase in the age-specific poisoning death rate per 100,000 population for the later four study years (1.7 in 1979 and 3.4 in 1982). However, poisoning deaths in this group have declined 68% since 1970 (rate of 7.1). The smallest percent change between 1970 and 1982 was that of the 25- to 45-year-olds (2.9 in 1970 and 2.2 in 1982).

Table 1 shows the frequency of accidental poisoning deaths in Minnesota by age group for 1982. The 25-44 age group consistently experienced a large number of accidental poisoning deaths (over 19 per year) for each of the later four study years from 1979 to 1982. Second only to motor vehicle accidents, poisoning accounted for more accidental deaths in the 25-44 age group than any other cause. The age-specific death rate for 15- to 24-year-olds declined by 50% during this time period (1979-1982) while the less than 5 years old maintained the lowest rate for any group in Minnesota.

For accidental poisoning deaths in Minnesota (1982), the over 65 age group suffers the greatest incidence in the category of solids and liquids. The rate of deaths by gas poisoning in Minnesota is 2 times the national rate for the 45-64 age group. The 1982 national data show age-specific death rates for accidental poisoning by solids and liquids, and by gases, both peak at age 65 and over.

The age at which the risk of dying from an accidental poisoning becomes significant is 15 years and over. It is at this point, in Minnesota and the nation as a whole, that age-specific death rates start to rise dramatically.

Sex

The ratio of males to females experiencing an accidental poisoning death (all types) in Minnesota decreased from 3:1 in 1970 to 2:1 in 1980 (latest sex-specific population data). However, males continue to experience a 3 times greater risk of poisoning death by gas. National data show results similar to Minnesota's.

Race

The highest race-specific rate of accidental poisoning deaths per 100,000 population in Minnesota was experienced by the American Indian population (30.7 in 1970 and 11.5 in 1980). For whites, the rate decreased by more than 50% from 1970 (rate of 3.3) to 1980 (rate of 1.5). The only race-specific rate increase for the past decade was experienced by the black population; the 8.8 accidental poisoning deaths per 100,000 black residents in 1970 increased to a rate of 9.4 in 1980.

Marital Status

Divorced residents of Minnesota experienced a 2 times greater risk of death from accidental poisoning (rate of 4.4) in 1980 than any other marital group. This was a significant decrease, however, from their 1970 rate of 13.4 per 100,000 divorced residents.

Widowed individuals also experienced a high rate (6.0) of poisoning deaths in 1970 but dropped to the lowest rate of any group (0.5) in 1980. Never-married individuals experienced a decrease from a

TABLE 1

Poisoning by Type and Age, Accidental Deaths, Minnesota, 1982

	All Ages	*Under 5 Years*	*5-14 Years*	*15-24 Years*	*25-44 Years*	*45-64 Years*	*65 and Over*
Total Poisoning by Solids and Liquids	36		1	2	14	6	13
Rate (deaths per 100,000 population)	.9		.2	.3	1.2	.8	2.6
Male	23		1	2	13	1	6
Female	13				1	5	7
Drugs, Medicaments, Biologicals	26		1		8	5	12
Male	14		1		7	1	5
Female	12				1	4	7
Analgesics, antipyretics, antirheumatics	4				2	2	
Barbiturates							
Other Sedatives, hypnotics					1		1
Tranquilizers	2				1	1	
Other psychotropic agents	2				2		
Other drugs acting on central and autonomic nervous system (including local anesthetics)	2				1		1
Antibiotics							
Anti-infectives							
Other drugs	14		1		1	2	10
Other Solids and Liquids	10			2	6	1	1
Male	9			2	6		1
Female	1					1	
Alcohol	8			1	5	1	1
Cleansing, polishing agents, disinfectants, paints, varnishes							
Petroleum products, other solvents and their vapors							
Agricultural, horticultural chemical, pharmaceutical preparations							
Corrosives, caustics							
Foodstuffs, poisonous plants							
Other unspecified solids and liquids							
Total Poisoning by Gases and Vapors	40	1		9	11	15	4
Rate (deaths per 100,000 population)	1.0	.3		1.2	.9	2	.8
Male	30			7	8	11	4
Female	10	1		2	3	4	
Gas distributed by pipeline							
Other utility gas, other carbon monoxide	39	1		9	11	14	4
Other gases and vapors	1					1	

rate of 3.2 to 0.98 in the past decade; married residents experienced a slight decrease (3.0 to 2.1) in accidental poisoning deaths during that time.

Agent/Vehicle Factors

Agent is defined as a form of physical energy: mechanical, thermal, radiant, electrical, or chemical. Some limited fields and ranges of energy provide stimuli for the sense organs, others induce physiological adjustment, and still others produce injury. Injuries to a living organism can be produced only by some energy interchange.

The agent relevant to poisoning is chemical energy that interferes with normal body energy exchange; the vehicle or means of energy transfer is the pill, or other item swallowed, inhaled, or touched. To induce injury, the energy forces must reach the host at rates in excess of his or her injury threshold.

Form

In 1980, the form of vehicle involved in accidental poisoning deaths in Minnesota differed greatly from the national pattern. Minnesotans experienced less than half the national rate of poisoning deaths per 100,000 population (0.6, Minnesota; 1.4, U.S.) due to solids and liquids and experienced twice the national rate of deaths (1.0, Minnesota; 0.5, U.S.) from gases and vapors.

This difference between Minnesota and national data becomes even more apparent when the category of solids and liquids is broken down further. Nationally, drugs-medicaments-biologicals accounted for the largest percentage of poisoning deaths (57%) while gases and vapors were second (29%) and other solids and liquids were third (14%) in 1980. For the same year in Minnesota, gases and vapors were first at 62%, drugs-medicaments-biologicals were second at 20%, and other solids and liquids, third at 18%.

During the four-year period from 1979 to 1982, accidental death rates by gases and vapors remained relatively constant (1.0 ± .3) in Minnesota. The rate for solids and liquids increased only slightly from 0.7 in 1979 to 0.9 in 1982. Over the past decade, the rate for both solids and liquids (1.4 in 1970 and 0.9 in 1982) and gases and vapors (2.1 in 1970; and 1.0 in 1982) decreased by approximately 50%.

Type

Table 1 presents those types of agents/vehicles most commonly associated with accidental poisoning deaths in Minnesota. One category stands out for all study years: "other utility gas, other carbon monoxide." Examination of the specific E-code (E868.2) reveals "exhaust gas from a motor vehicle, not in transit" accounted for the greatest number of accidental poisoning deaths in this state. In Minnesota this category accounted for 58% of all accidental poisoning deaths in 1980; nationally it accounted for 23% of the total during the same period.

In Minnesota (1979-1982), alcohol was associated with the largest number of accidental poisoning deaths from solids and liquids. Nationally, alcohol was second to analgesics-antipyretics-antirheumatics.

Examining only drugs-medicaments-biologicals, the classification of analgesics-antipyretics-antirheumataics presented the greatest number of deaths in Minnesota (1979-1982) and nationally (1980). For Minnesota, this is a change from 1970, when barbiturates represented a slightly greater percent.

Summary

In 1980, Minnesota experienced twice the national rate of death from gases and vapors and half the national rate of deaths from solids and liquids. Gases/vapor death rate comparison with neighboring states shows that although Wisconsin presents rates (1980, 0.9; 1982, 1.0) similar to Minnesota's, North Dakota presents a 1980 rate of 1.2 and a 1982 rate of 0.6 per 100,000 population. North Dakota's 1982 rate is equal to national standards. Thus, commonality among Minnesota's neighboring states appears inconsistent.

Within the area of drugs-medicaments-biologicals, the analgesics-antipyretics and antirheumatics were first, both nationally and in Minnesota, in 1980. However, this is a change for Minnesota, where barbiturates accounted for the greatest number of deaths in this category in 1970.

Although trends in accidental poisoning death rates have shown a 50% decline over this decade, accidental poisonings still accounted for 66 deaths (1.4 per 100,000 population) in Minnesota in 1980. The greatest percentage (60%) of these deaths occurred in the home environment. Winter represented a large number of accidental poisoning incidents.

Of the cases of accidental poisonings in Minnesota, the 25- to 44-year-olds experienced the greatest number of deaths. Unlike exposure rates, the accidental death rate for the population under five years old remains the lowest. Males experienced a 2 times greater risk of death due to accidental poisoning. The highest race-specific rates were experienced by the American Indian (11.5 in 1980) and the black population (9.4 in 1980), while the white residents experienced a rate of 1.5 per 100,000. Divorced residents of Minnesota experienced a 2 times greater risk of accidental poisoning death in 1980 than any other marital group.

These trends in person, place, and time variables describe the occurrence of accidental poisoning death in Minnesota. The decline of barbiturates as a major agent associated with poisoning death is one such change needing further investigation. The 50% decline in overall rate of death is another. While these positive responses to control of accidental poisoning are evident, there are also areas of concern described in the data. The death rate in Minnesota associated with gases and vapors is high as compared with the nation as a whole. Why these trends have occurred leaves room for speculation. The answer requires more in-depth investigation of the most severe consequences of accidental poisoning—death.

Acknowledgments

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		0-4 months	0-8 months	0-12 months	No. patients
USA[1]	ranitidine 150 mg h.s.	9%	14%*	16%†	60
	cimetidine 400 mg h.s.	23%	34%	43%	66
UK, Ireland, Australia[2]	ranitidine 150 mg h.s.	8%‡	14%‡	23%‡	243
	cimetidine 400 mg h.s.	21%	34%	37%	241

*$p=0.02$
†$p=0.01$
‡$p \leq 0.004$
%=life-table estimates
All patients were permitted prn antacids for relief of pain.

These two trials used the currently recommended dosing regimen of cimetidine (400 mg h.s.) and ranitidine (150 mg h.s.). A comparison of other dosing regimens has not been studied.

The studied dosing regimens are not equivalent with respect to the degree and duration of acid suppression or suppression of nocturnal acid.

The superiority of ranitidine over cimetidine in these trials indicates that the dosing regimen currently recommended for cimetidine is less likely to be as successful in maintenance therapy.

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References:

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3. Data available on request, Glaxo Inc.

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(ranitidine hydrochloride)

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INDICATIONS AND USAGE: ZANTAC® is indicated in:

1. Short-term treatment of **active duodenal ulcer** Most patients heal within four weeks.
2 **Maintenance therapy** for duodenal ulcer patients at reduced dosage after healing of acute ulcers.
3. The treatment of **pathological hypersecretory conditions** (eg, Zollinger-Ellison syndrome and systemic masfocytosis).
4 Short-term treatment of **active, benign gastric ulcer** Most patients heal within six weeks and the usefulness of further treatment has not been demonstrated.
5. Treatment of **gastroesophageal reflux disease (GERD)** Symptomatic relief commonly occurs within one or two weeks after starting therapy. Therapy for longer than six weeks has not been studied.

In active duodenal ulcer; active, benign gastric ulcer; hypersecretory states; and GERD, concomitant antacids should be given as needed for relief of pain.

CONTRAINDICATIONS: ZANTAC® is contraindicated for patients known to have hypersensitivity to the drug.

PRECAUTIONS: General: 1 Symptomatic response to ZANTAC® therapy does not preclude the presence of gastric malignancy. 2. Since ZANTAC is excreted primarily by the kidney, dosage should be adjusted in patients with impaired renal function. Caution should be observed in patients with hepatic dysfunction since ZANTAC is metabolized in the liver.

Laboratory Tests: False positive tests for urine protein with Multistix® may occur during ZANTAC therapy, and therefore testing with sulfosalicylic acid is recommended

Drug Interactions: Although ZANTAC has been reported to bind weakly to cytochrome P-450 in vitro, recommended doses of the drug do not inhibit the action of the cytochrome P-450-linked oxygenase enzymes in the liver. However, there have been isolated reports of drug interactions which suggest that ZANTAC may affect the bioavailability of certain drugs by some mechanism as yet unidentified (eg, a pH-dependent effect on absorption or a change in volume of distribution).

Carcinogenesis, Mutagenesis, Impairment of Fertility: There was no indication of tumorigenic or carcinogenic effects in lifespan studies in mice and rats at doses up to 2,000 mg/kg/day.

Ranitidine was not mutagenic in standard bacterial tests *(Salmonella, E coli)* for mutagenicity at concentrations up to the maximum recommended for these assays.

In a dominant lethal assay, a single oral dose of 1,000 mg/kg to male rats was without effect on the outcome of two matings per week for the next nine weeks.

Pregnancy: ***Teratogenic Effects: Pregnancy Category B:*** Reproduction studies have been performed in rats and rabbits at doses up to 160 times the human dose and have revealed no evidence of impaired fertility or harm to the fetus due to ZANTAC. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers: ZANTAC is secreted in human milk Caution should be exercised when ZANTAC is administered to a nursing mother.

Pediatric Use: Safety and effectiveness in children have not been established.

Use in Elderly Patients: Ulcer healing rates in elderly patients (65 to 82 years of age) were no different from those in younger age groups. The incidence rates for adverse events and laboratory abnormalities were also not different from those seen in other age groups

ADVERSE REACTIONS: The following have been reported as events in clinical trials or in the routine management of patients treated with oral ZANTAC®. The relationship to ZANTAC therapy has been unclear in many cases. Headache, sometimes severe, seems to be related to ZANTAC administration.

Central Nervous System: Rarely, malaise, dizziness, somnolence, insomnia, and vertigo. Rare cases of reversible mental confusion, agitation, depression, and hallucinations have been reported, predominantly in severely ill elderly patients.

Cardiovascular: Rare reports of tachycardia, bradycardia, and premature ventricular beats.

Gastrointestinal. Constipation, diarrhea, nausea/vomiting, and abdominal discomfort/pain.

Hepatic: In normal volunteers, SGPT values were increased to at least twice the pretreatment levels in 6 of 12 subjects receiving 100 mg qid IV for seven days, and in 4 of 24 subjects receiving 50 mg qid IV for five days. With oral administration there have been occasional reports of reversible hepatitis, hepatocellular or hepatocanalicular or mixed, with or without jaundice.

Musculoskeletal: Rare reports of arthralgias.

Hematologic: Rare reports of reversible leukopenia, granulocytopenia, thrombocytopenia, and pancytopenia.

Endocrine: Controlled studies in animals and man have shown no stimulation of any pituitary hormone by ZANTAC and no antiandrogenic activity, and cimetidine-induced gynecomastia and impotence in hypersecretory patients have resolved when ZANTAC has been substituted. However, occasional cases of gynecomastia, impotence, and loss of libido have been reported in male patients receiving ZANTAC, but the incidence did not differ from that in the general population.

Integumental: Rash, including rare cases suggestive of mild erythema multiforme, and, rarely, alopecia.

Other: Rare cases of hypersensitivity reactions (eg, bronchospasm, fever, rash, eosinophilia) and small increases in serum creatinine.

DOSAGE AND ADMINISTRATION: Active Duodenal Ulcer: The current recommended adult oral dosage is 150 mg twice daily. An alternate dosage of 300 mg once daily at bedtime can be used for patients in whom dosing convenience is important. The advantages of one treatment regimen compared to the other in a particular patient population have yet to be demonstrated.

Maintenance Therapy: The current recommended adult oral dosage is 150 mg at bedtime.

Pathological Hypersecretory Conditions (such as Zollinger-Ellison Syndrome): The current recommended adult oral dosage is 150 mg twice a day In some patients it may be necessary to administer ZANTAC® 150-mg doses more frequently Doses should be adjusted to individual patient needs, and should continue as long as clinically indicated Doses up to 6 g/day have been employed in patients with severe disease.

Benign Gastric Ulcer: The current recommended adult oral dosage is 150 mg twice a day.

GERD: The current recommended adult oral dosage is 150 mg twice a day

See full prescribing information for dosage adjustment for patients with impaired renal function.

HOW SUPPLIED: ZANTAC® 300 Tablets (ranitidine hydrochloride equivalent to 300 mg of ranitidine) are yellow, capsule-shaped tablets embossed with "ZANTAC 300" on one side and "Glaxo" on the other. They are available in bottles of 30 (NDC 0173-0393-40) and unit dose packs of 100 tablets (NDC 0173-0393-47).

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Store between 15° and 30°C (59° and 86°F) in a dry place. Protect from light. Replace cap securely after each opening.

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Ultraviolet Radiation Effects on the Human Eye

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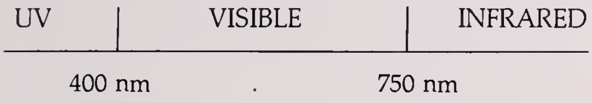
The lens of the human eye changes during life-long exposure to ultraviolet radiation. This has been implicated as a cause of cataract formation. When a cataract is removed, there appears to be increased risk of retinal damage from the ultraviolet radiation in our environment.

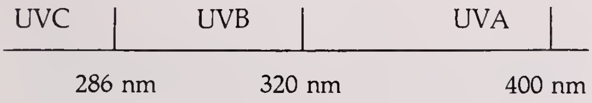
Recent research suggests that ultraviolet radiation in our environment is responsible for cataract formation and other ocular pathology. Our natural crystalline lens absorbs ultraviolet radiation to protect the retina, but chemical changes take place in the process. It is becoming more obvious that we should protect our eyes with special ultraviolet filters to prevent cataract formation. Ultraviolet light also has a detrimental effect on retinal cells. Many ophthalmologists are aware they must proctect the patient's retina with ultraviolet filters after cataract surgery because the natural filter has been removed.

Emitted solar energy is composed of three types of radiation: ultraviolet, visible, and infrared.



A nanometer (nm) is one billionth of a meter (10^{-9}).

The most dangerous region is the ultraviolet, which is divided into three main categories:



UVC - This very harmful energy has a wavelength below 286 nm. It is filtered by the ozone layer which is 10 to 20 miles above sea level. Scientists have been aware of this protective layer and are concerned about any depletion effects that may be caused by nitric oxide from supersonic jets, fluorocarbons from spray cans, etc.

UVB - This is the region from 286 to 320 nm and is the solar energy that causes sunburn. This is about 3% of the total UV-emitted energy reaching the earth. Clouds and fog do not filter any of this radiation. As many of us have discovered, it is possible to get sunburned on a cloudy day.

UVA - This is the region from 320 to 400 nm and has been shown to harm the eyes over a long exposure in low doses. Ninety-seven percent of the total solar energy affecting us is in this band.[1]

Infrared radiation (750-1500 nm) from sources produced by man is actually emitted in higher doses than the corresponding radiation from the sun, and we know that intense infrared radiation can cause cataracts by a thermal effect on the human lens. Therefore, protective goggles are used during exposure to infrared sources such as the carbon arc and tungsten arc light, molten glass, or a blast furnace.[2]

Man-made sources of ultraviolet radiation that emit UVB and UVA include Xenon arc lamps, high intensity mercury lamps, and germicidal fluorescent lamps. Although the radiation emitted is small, the effects are cumulative.

The UV radiation reaching us is in the band from 286 to 400 nm. This energy has a photo-oxidizing effect on the lens of the eye. Tryptophan is the photosensitive substance most often mentioned as being involved in this process.[3] In the presence of oxygen, it is photo-oxidized into pigmented and fluorescent products that are very reactive. (Certain proteins, such as the enzyme catalase, can be inactivated in the cornea or lens epithelium by these photoproducts.) The accumulation of these byproducts leads to greater pigmentation of the lens with increasing age. Insoluble proteins, which have the greatest pigmentation, also accumulate during this process.[4] The tryptophan photoproducts inhibit growth of cells by interfering with the formation of DNA, RNA, and protein. It is thought that this inactivation occurs through the generation of a hydrogen peroxide from tryptophan and epinephrine.[3] This may also be the explanation for retinal damage secondary to ultraviolet exposure.

Cataract Formation

The common type of cataract formation related to age is nuclear sclerosis. The nucleus of the crystalline lens hardens and turns a yellowish color that darkens to brown over a period of time.

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The yellow color actually is a natural protective filter to UV light but will block visible light with time, and therefore decreases vision. The older lens fibers accumulate in the nucleus of the lens. Newer and younger fibers form in the outer cortex area. Therefore, the nuclear cells are the ones that are cumulatively affected by ultraviolet light, which causes the age-related central pigmentation.

Sir Steward Duke-Elder, one of the foremost ophthalmologists of our century, noted in 1926 that there was a relationship of increased formation of cataracts in the areas of the world with greater sunlight exposure. A careful epidemiological study conducted during the 1970s concluded that more cataracts are formed in persons over the age of 65 in the locations with large amounts of sunlight.[5] All possible variables were considered in this study including concomitant eye disease, mobility of the elderly into the sunny regions, ability to get eye care, etc. (In vitro biological studies showed that extracted lens proteins on whole lenses exposed to artificial near UV light will have altered physical and chemical properties of the crystalline lens.) A smaller study, performed by researchers from Johns Hopkins Wilmer Institute, compared eye pathology between Chesapeake watermen and coal miners from southwestern Pennsylvania.[6] The watermen were exposed throughout their working day to incident and reflected sunlight. The coal miners, on the other hand, received no exposure to sunlight and UV radiation. The wives in each group served as controls. There was a definite increase in specific eye conditions in the watermen, such as pteryguims, climate droplet keratopathy, and pseudoexfoliation of the lens capsule. These conditions are known to be related to UV exposure.

The UV spectrum of importance to the eye is from 280 to 400 nm. The human cornea absorbs radiation below 300 nm, the lower portion of UVB, but transmits the energy from 300 to 400 nm. High levels of exposure can have pathological effects on the cornea, such as keratitis (snow blindness) or a recurrent episode of herpes simplex keratitis.[7]

The lens of the human eye absorbs the bulk of UV radiation up to 400 nm. Therefore, the crystalline lens acts as a natural UV filter to protect the retina. Continuous UV exposure, however, has a definite deleterious effect on the lens from cumulative photochemical damage. Studies have shown that tryptophan in the lens is changed to specific photoproducts by UV wavelengths at a peak of 320 nm.[3] These chromatic photoproducts bind to various proteins in the lens, altering its soluability and changing its color to yellow or brown. Intense brunescent cataracts in the past have been called "sunshine cataracts." It is now reasonable to accept the theory that chronic exposure to UV light is the main factor involved in this type of cataract formation.[8]

Photosensitivity

There are many photosensitizing medications that can increase any potential harmful effects of UV radiation. These medications include antibiotics such as tetracyclines and sulfonamides, hypoglycemic agents, estrogens, progesterones, phenothiazines, cyclamates, psoriatic medications (furocoumarines), and psychotropic drugs such as Valium and Librium. Dr. Sidney Lerman of Emory University and Dr. Otto Hockisim of the University of Bonn have developed a method called UV Slit Lamp Densitography that may help monitor changes related to these photosensitizing medications. This method measures fluorescent chemical materials in the human lens. Molecular changes can be determined from the effects of the UV radiation and medications. Specific by-products have been found in cataractous lenses after surgery. It is also believed that retinal cells will bind photosensitizing drugs. Consequently, in the aphakic eye, the UV light could harm the retina.

Certain people appear to be at a greater risk to UV exposure depending on their occupation (pilots, lifeguards, farmers, welders, etc.); their geographic location (higher altitudes such as Denver, the "sunbelt" area close to the equator); or their recreational activity (skiing, sailing, flying). More than 60% of the solar UV light is transmitted between the hours of 10 a.m. and 2 p.m.

Additional studies need to be done to provide more definitive proof that UV exposure causes cataracts, but most researchers agree that a definite link exists.

Retinal Damage

Not only is the lens of the eye affected by UV radiation, but the retina is affected as well. This fact is of practical importance, because after cataract surgery the natural UV filter has been removed, leaving the retina with no protection. Multiple studies have shown the harmful effects of UV energy on the retina at various wavelengths for specific periods. Researchers believe that hydrogen peroxide (which is a photoproduct from the irradiation of tryptophan) inactivates the protein-synthesizing system in the retinal cells.[3] Researchers are investigating certain retinal problems of aphakics with the UV theory in mind. These problems include cystoid macular edema, erythropsia (pink vision), and severe glare. There are some who now believe that macular degeneration in aphakics is solar rather than "senile."

Eye Protection

As evidence accumulates, it will become more obvious whether we should protect our eyes from the UV radiation in the environment. It seems reasonable to do so if we are under increased exposure (pilots, farmers) or we have had our natural filter (cataract) removed. The protection may delay or lessen cataract formation for the phakic eye and reduce the chance of retinal damage in the aphakic eye.

Up until the last couple of years, UV absorbing lenses were not available. Certain spectacle lenses absorb some ultraviolet radiation, but not 100%. Life-long spectacle wear has been shown to decrease the degree of nuclear sclerotic changes in the crystalline lens, although in one study it did not significantly alter the visual acuity.[9]

Clear crown glass filters up to 99% of the shorter wavelength (290-300 nm) but the amount absorbed decreases with the longer wavelengths (30% of 330 nm). There is no effect in the region from 330 to 400 nm. Standard optical plastic (CR - 39) absorbs to approximately 320 nm. Longer wavelengths are still transmitted to the eye. Photochromic lenses filter the UV to 350 nm, but still a gap exists to 400 nm. Recent products now filter to 400 nm.

Many tinted sunglasses do no better in absorbing the UV light. There is no direct correlation between the darkness of sunglasses and the amount of protection. With this in mind, you may begin to realize that more harm can be done by wearing sunglasses! Visible light (430-600 nm) is screened so the pupil will enlarge, thus letting in more UV light. Also, when the glare and bright rays are controlled and decreased, one is more comfortable and will squint less—also increasing the risk of excessive UV exposure.

Many opthalmologists are prescribing the newer UV filter for patients after cataract surgery to decrease the risk of retinal damage. This is considered especially important in the younger, more active patient who will have years of sunlight exposure. Those patients having the implantation of the intraocular lens have no more protection than wearing spectacles. The implant material PMMA (polymethylmethacrylate) absorbs only below 320 nm. New intraocular implants are now being made with a UV filter.

From various studies it can be concluded that the human aphakic is at increased risk for retinal damage from UV light. As the wavelength decreases, the retina is more sensitive to damage. It is six times more sensitive with 350 nm wavelength compared to 441 nm.[10]

Summary

As more research is completed, a definite correlation seems to arise between the cumulative exposure to ultraviolet radiation and cataract formation. Certain people may be at higher risk—pilots, farmers, welders, or those exposed to photosensitizing drugs. Spectacles and even sunglasses don't absorb all of the harmful UV radiation. It seems reasonable to wear glasses with a UV filter, which may decrease cataract formation.

The retina in the aphakic or pseudophakic (with the implant) patient is at an increased risk of developing retinal pathology, which is likely correlated with UV exposure. UV filter should be prescribed for these people.

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The Minnesota Academy of Family Physicians' Research Network: A Vehicle for Practice-Based Research

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Research in primary care practices is increasingly important to both practitioners and academicians. The Minnesota Academy of Family Physicians has developed a Research Network as a resource for such research. The family practitioners in this organization appear to be relatively typical of their Academy colleagues except they are more likely to be residency-trained and in outstate practices. Those with appropriate research projects are invited to make use of this resource.

Concerns about rising costs and changing delivery systems are forcing us to develop a better understanding of both the process of care and the most effective and cost-efficient ways to prevent and manage disease. In addition, the selection bias of studies that are based on patients seen by referral physicians and tertiary care centers reduces applicability of these studies for primary care.[1] More of our research, therefore, should involve primary practice settings and practicing physicians.

The recent emergence and growth of research organizations for family practice, general internal medicine, and ambulatory pediatrics is evidence that this necessary development is occurring.[1]* The growth of journals for the publication of primary care research is further evidence. However, the most important change may be the growing interest of researchers in conducting studies in office practice settings.

In the past, such practice studies have been arranged by the researchers contacting practitioner organizations or by mailings directly to practitioners. A new development is occurring that is designed to facilitate this kind of collaboration—the formation of networks of practices or practitioners interested in research involvement. These networks have taken various forms and have developed a range of approaches and goals, but they are proliferating. Within family practice alone there are probably 70 such networks in operation or in some stage of development.

This article is designed to describe a local network (The Minnesota Academy of Family Physicians' Research Network or MAFPRN) and to advance four objectives:

- To make researchers aware of this resource for conducting studies at primary care sites.
- To help other family physicians in the state understand this opportunity so that they can consider joining.
- To be an example for physicians anywhere and in any field who may be contemplating the establishment of a similar program.
- To provide recognition that practice-based research is a potential stimulant to both the intellectual growth of the participants and to a general improvement in cost-conscious quality care.

Background

The MAFPRN had its beginning in 1978 when the Minnesota Academy of Family Physicians (MAFP) established a research panel to provide participation in practical research as one of the best ways for practitioners to continue their educational growth.[2] This panel developed and piloted two studies of in-office and after-hours telephone calls. Subsequently, 33 family practice clinics throughout the state successfully participated in a definitive in-office call study, and 16 clinics did the same for after-hours calls.[3,4,5]

The success of these studies and the strong interest among the participating family practitioners[2]* clearly seemed to indicate that an ongoing organization might be useful. The goals for such an organization were:

- To screen and facilitate the increasing number of researcher requests for Academy support in approaching family physicians about participation in their projects.
- To encourage and support individual or group research projects by its members.
- To train members in research methodology.

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[1] *NAPCRG (North American Primary Care Research Group), SREPCIM (Society for Research & Education in Primary Care Internal Medicine) & APA (Ambulatory Pediatric Association)

[2] *A total of 60 clinics had expressed original interest in the office call study and 45 in the after-hours study.

- To develop and coordinate research support resources for members.

A proposal was submitted to the American Academy of Family Physicians for a research grant to investigate and initiate a formal network. In February 1983, the AAFP approved a grant of $3,845 for this purpose.

The first task in this investigation was to study other research networks. A visit was made to one of the earliest American networks, the Private Practice Research Group (PPRG) founded by the Psychiatry Department at the University of Pennsylvania in the 1970s.[6] This group had performed a number of mental health drug studies, but it seemed to lack any real practitioner sense of ownership and to be in decline.

The best known existing networks are the Ambulatory Sentinel Practice Network (ASPN) that was started by the North American Primary Care Research Group[7] (NAPCRG) and the Primary Care Cooperative Information Project (COOP) that grew from Dartmouth's Department of Community and Family Medicine.[8] These networks provide strong examples of arrangements for primary care practitioners to have a major role in the selection and development of research studies, but the requirements and costs of their programs make them difficult to duplicate. For example, ASPN requires that participants provide detailed age-sex registers and that they cooperate with every study performed by the network; and COOP was built around a shared practice information computer system. Both of these networks required large grants for start-up and maintenance.

After studying these and other networks, we decided that ours should take a different form. Since our network would not be able to depend on much income, it should serve primarily a brokering function, bringing together researchers and interested practitioners for specific studies that are financially supported by the researchers.

By November 1984, a data bank identifying those Academy members interested in being made aware of research projects was established and a steering committee formed to coordinate and screen projects for them.

Existing Network

At present, the Steering Committee functions as a subcommittee of the MAFP Research Committee and its only operational funds are the $300 a year provided by MAFP to handle communications and meetings. There are seven members on the Steering Committee from the Network membership and one member from the research program at the University of Minnesota's Department of Family Practice and Community Health.

The Steering Committee's task is to promote the Network (by providing members with a newsletter, research training information, and help with their individual projects), while finding, screening, and modifying research projects that wish to use the Network membership. Guidelines for this screening process were approved by the MAFP Board of Directors, but the main purpose of the screening is to ensure that projects are of good technical quality, that they permit significant input by the Network members, and that they provide protection for patients, physicians, and practice operations. An ideal project is one that also has a Network member as co-investigator and that helps the participants to learn more about research methodology.

Even after a research project has been approved by the Steering Committee, it is still up to each practitioner in the Network to decide whether personal interest, timing, and project requirements merit involvement. Because there is a data base on the membership, it is easy to identify those who may be most appropriate for a particular study.

As of January 1984, there were 68 family physician members in the Network, 50 of whom are in full-time practice. The other 18 are either residents or faculty members. Table 1 compares characteristics of these 50 practitioners to those of Academy members as a whole.[9] The two groups have some similar characteristics, although a much higher percentage of Network members have had residency training and disproportionately more are from areas outside the metropolitan Twin Cities region. These data are similar to those found in a Canadian study that compared 141 family physicians who volunteered for research study participation to 2,901 of their provincial colleagues.[10] The researchers were concerned that the volunteers might be an unrepresentative group and that that might bias the studies. However, they found that the only unique feature of the volunteers was a lesser likelihood of being from a metropolitan area. It is not clear whether it is somehow easier to conduct research in small practices from small cities, or whether a network like this provides a valuable source of colleagiality.

Table 2 provides further information about the practitioners in our Research Network. All members were also asked about their previous research experience and about the role(s) they

TABLE 1

Comparison of Research Network Members (1984) with a Survey of MAFP Members (1980)

	Research Network (%)	*Minnesota Academy (%)*
Completed residency	66.0	27.3
Board certified	86.0	73.0
Location (urban size):		
> 100,000	38.0	56.2
25,001 - 100,000	10.0	7.7
5,000 - 25,000	28.0	10.7
< 5,000	24.0	25.4
Group size is 1-2 MDs	40.0	25.5

TABLE 2

Practice Characteristics of Research Network Members

Characteristic	*Percentage*
Group Size:	
1-2	40
3-5	34
6-10	24
>10	2
Services Provided:	
Obstetrics	78
Major surgery	16
Fractures/minor surgery	93
Well-child	98
Counselling	84
Patients in HMOs:	
0-10%	48
11-50%	30
51-100%	8
No answer	14
Office Visits/Month/MD*:	
<300	22.5
300-400	22.5
401-500	37.5
>500	12.5
Nursing Home Visits/Month/MD*:	
<10	32.5
10-20	35.0
>20	22.5
Hospital Visits/Month/MD*:	
<25	10.0
25-50	25.0
51-100	30.0
>100	20.0

*Response total <100% because balance were "no answer."

wished to play in research. The responses are shown in Table 3.

TABLE 3

Research Experience and Interests

	Practitioners		*Faculty*	
	No.	*%*	*No.*	*%*
Research Experience:				
Much	3	6	1	8
Some	15	30	6	46
Little	13	26	5	38
None	19	38	1	8
Participation Desires:				
Personal Projects	17	34	10	77
Projects with others	34	69	11	85
Data collection	44	88	12	92

It should be pointed out that the faculty and residents also have access to a significant patient care base through the residency clinics. Moreover, although faculty members do not report much more research experience than the practitioners, they have easy access to a greater pool of research resources through their departments and institutions. Finally, in addition to the 50 family practitioners in the Network, there are another 150 practitioner colleagues in their practices—most of them family physicians. Many of these physicians have indicated a willingness to cooperate with their Research Network colleagues in certain projects.

Conclusion

This network of family physicians is functional now and is interested in making contact with researchers who might like to develop a collaborative practice-based project. In addition, other family physicians are welcome to join. Inquiries can be directed to the authors or to the Minnesota Academy of Family Physicians, Suite 426, Health Associations Center, 2221 University Avenue S.E., Minneapolis, MN 55414.

Acknowledgments

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Physicians Contemplate Artificially Administered Nutrition and Hydration

The following report was presented to the 1986 Minnesota Medical Association House of Delegates by the MMA Committee on Ethics and Medical-Legal Affairs. Approval of the report and adoption of Resolution 14 by the House in May 1986 established the MMA policy on artificially administered nutrition and hydration.

Resolution 14

WHEREAS, the primary goal of health care is to maximize each patient's well-being within the context of patient self-determination, and WHEREAS, medical treatment is defined as services rendered by physicians and by nurses and other professional and technical personnel under the direction of a physician to benefit a patient through returning to maximally effective functioning, relieving pain, and suffering, protecting against disability, and preserving life, and WHEREAS, the artificial administration of nutrition and hydration fits within this context, now therefore, be it RESOLVED, that the artificial administration of nutrition and hydration is a medical treatment, and be it further RESOLVED, that decisions to initiate or forego this treatment should be governed by the same decision-making procedures and principles that govern medical treatment in general.

Introduction to the Report

The purpose of this paper is to provide guidance for physicians in evaluating issues relating to the limiting, withholding, or withdrawing of artificial nutrition and hydration. As our population ages, physicians, patients, and families will be faced with such decisions with increasing frequency. We hope to promote good practice from a medical, ethical, and legal perspective regarding such decisions.

The Sanctity of Life

An in-depth discussion of the concept of sanctity of life is beyond the scope of this paper. However, the way in which the patient, the family, and the physician interpret the concept of sanctity of life is a relevant factor in all decisions to limit medical treatment. Some individuals view biological existence itself as sacred, and contest the morality of limiting any medical treatment that could potentially prolong life. Others focus instead on quality of life issues—the capacity of an individual to think, feel, communicate, and interact with the environment. Medical treatments that prolong life beyond the point at which it has "meaning" or "quality" for them may be viewed by these individuals as unwarranted interference. The majority opinion probably lies between these two points of view.

In the realm of medical ethics there seems ample room for all viewpoints. Discussion with those most intimately involved in individual cases is essential to good decision making. It would be unfortunate, however, for one viewpoint to become institutionalized or elevated to the status of a standard for all.

Food and Water/Artificially Administered Nutrition and Hydration

Food and water are essential to life. Many religious symbols and sacraments equate food and water with life itself. If the patient can swallow, both common sense and good medical care require that food and water should be provided. (The single exception may be fasting under careful medical supervision to treat morbid obesity.)

But there are some circumstances that make it difficult for a patient to eat or drink (e.g., severe nausea, obstruction of the gastrointestinal tract, chronic severe aspiration, unconsciousness). Most dying patients have little appetite. Until the development of a flexible tubing for administering nutrition and hydration artificially, nothing could be done for those who were too weak or uninterested in obtaining nourishment through normal means. Today's medical technology has developed a number of ways to artificially administer nutrition and hydration to such patients. The first general method is by liquids administered by tube, either nasogastric, gastrostomy, or jejunostomy. A nasogastric tube introduces nutrition and hydration through a tube inserted through the nose and esophagus into the stomach. A gastrostomy and jejunostomy involves a surgical procedure to insert a tube through the abdominal wall and directly into the stomach or jejunum.

The second major way to artificially administer nutrition and hydration is by intravenous means. A peripheral intravenous catheter introduces fluids directly into the bloodstream through a small needle. It is useful only as a temporary effort to improve hydration and electrolyte concentrations. For a balanced diet over a long period of time, a special catheter is placed into one of the major veins in the chest.

Artificially Administered Nutrition and Hydration—A Medical Treatment

Health care aims to maximize each patient's well-being within the context of patient self-determination. Medical treatment maybe defined as:

> Services rendered by physicians, and by nurses and other technical personnel under the direction of a physician, to benefit a patient through returning the patient to a maximal level of functioning, relieving pain and suffering, protecting against disability, and preserving life.

Using this definition, it is clear that the artificial administration of nutrition and hydration is not an extension of normal feeding, but rather, is a medical treatment.

Artificially administered nutrition and hydration is a service prescribed by a physician and provided by health personnel under the direction of a physician. Nutrition and hydration may be artificially administered as a part of the overall treatment plan for a patient whose acute or chronic condition makes it difficult or impossible to take adequate food and fluids by mouth. The patient's condition and medical knowledge and judgment dictate the amount and type of artificially administered nutrition and hydration. For example, the physician would monitor the blood constituents of the patient with heart or kidney failure and accordingly adjust the nutrients administered. Just as for other medical procedures, artificially administered nutrition and hydration must relate to some attainable treatment objectives (e.g., returning the patient to a maximal level of functioning, relieving pain and suffering, protecting against disability, and preserving life).[2]

Because the administration of nutrition and hydration by artificial means is a treatment, and is not the same as continuing normal feeding, consent is required. Because it is invasive, proceeding without the permission of the patient if competent, or the appropriate family member or guardian if the patient is unable to answer for himself or herself, could constitute assault.

All means by which nutrition and hydration can be artificially administered can improve the outcome for some patients. All have associated risks, including, among others, infection, bleeding, effusion into body tissues, and perforation of the esophagus. These risks become more significant with long-term use of the procedure. The benefits of the procedure must outweigh the risks. This is an area in which the values of the patient and family play a significant role in assessing the kinds of treatment that may be considered disproportionately burdensome. Decisions to initiate or limit this treatment should be governed by the same decision-making procedures and principles that govern treatment in general in the context of the values of the patient and/or caring family members.

Decreasing the Intensity of Medical Treatment

There are several situations in which it is appropriate to limit any medical treatment, as noted below:

1. The goals of treatment have been reached and the illness has been cured or has otherwise subsided.
2. The priorities of treatment have changed due to the occurrence of other conditions or disease states.
3. The risks and burdens of the treatment are judged to outweigh the benefits.
4. The treatment has been judged to have been a failure.
5. The total clinical outlook of the patient has become so poor that treatment has been judged to be meaningless and might be construed as prolonging dying rather than prolonging life.
6. Another form of treatment has been judged to be more effective, possibly because of changing conditions and situations.

Specifically, the treatment goals and objectives associated with the artificial administration of nutrition and hydration may also change as the patient's medical condition changes. The following are examples in which the withdrawal of artificially administered nutrition and hydration might be appropriate:

1. The treatment goal has been reached. The patient is able to take food and water satisfactorily.
2. An organ system or biologic function fails, making the artificial administration of nutrition and hydration more of a risk than a benefit. (Examples: severe heart, kidney, or liver failure; coagulation disorder, etc.)
3. Complications of the treatment have developed, such as an infection of the indwelling intravenous catheter, thrombosed veins, etc.
4. Conditions have developed that make the artificial administration of nutrition and hydration very difficult, such as absence of suitable mental states such as agitation, and the resulting frequent pulling out of I.V.s, N.G. tubes, etc.
5. The overall outlook for the patient is so poor that continued treatment becomes unacceptably burdensome even for palliation.

Complicating Factors in Decisions to Forego Artificially Administered Nutrition and Hydration

Family members of patients who are in a persistent vegetative state and/or are terminally ill are subject to major disruption of their lives, with significant emotional and financial strains. The decisions that they may face regarding the care of their loved one are difficult indeed. They have a strong interest in the respectful and loving care of their family member and in seeing that he or she does not suffer. They may mistakenly view the artificial administration of nutrition and hydration as an extension of normal feeding or equate the withdrawal of this procedure with suffering. Family members are frequently divided in their opinions and feelings regarding life-prolonging care and treatment, including artificially administered nutrition and hydration. The family frequently does not want the responsibility of making decisions that would hasten the death of a loved one.

The decision not to initiate or to withdraw artificially administered nutrition and hydration is difficult for physicians as well. Uncertainty of diagnosis and/or prognosis make it difficult to evaluate the length and quality of life. The medical ethic and centuries of tradition make it natural for physicians to seek to extend life whenever possible and to comfort and care for their patients. Physicians are generally prone to do more, not less, for their patients. Nutrition and hydration may be provided artificially simply as an expression of caring. Micetich et al. note that a psychological human-to-human bond between the physician and the patient is created by "doing something," however ineffective, rather than by "standing by."[3] Physicians also know that total withdrawal of artificially administered nutrition and hydration may contribute to an earlier death than if the treatment had been continued. This may cause a great deal of guilt for the physician.

Physicians frequently have a sense of failure when a patient under their care dies. A wish to avoid or deny imminent death may cause the physician to continue treatments when the patient could not possibly benefit. The discontinuation of artificially administered nutrition and hydration or other treatments under hopeless situations may be perceived by the physician and others as abandonment of the patient. And, while ethicists have established that there is no moral distinction between withholding and withdrawing medical treatments, emotions do not always equate with this.

Public perceptions of artificially administered nutrition and hydration as an extension of normal feeding rather than as a medical treatment may also influence the physician's actions. Professional liability pressures may persuade physicians to continue treatment, especially if family members are divided in their opinions.

Conclusion

Because it is invasive and administered by physicians or under physicians' guidance, the artificial administration of nutrition and hydration qualifies in every respect as a medical treatment. By considering it as such, patients, their family members, and physicians involved in their care can evaluate this treatment in the context of their own value systems and the other medical care provided. The process for deciding to limit, withhold, or withdraw any medical treatment, including the artificial administration of nutrition and hydration should include a full discussion with the patient or appropriate family members. The following may provide useful guidance:

1. Medical orders to limit (withhold or withdraw) treatment should not be undertaken without full discussion of the diagnosis, prognosis, benefits, risks, and consequences of various treatment alternatives with the patient and appropriate family members.
2. With the concurrence of the patient and/or appropriate family members, the physician should seek to involve the nursing staff or other caregivers in the discussion.
3. If the patient is competent, the decision to limit treatment will be reached consensually between the patient and the physician.
4. For patients who are not competent, the decision to limit treatment will be reached consensually by the appropriate family members and/or the patient's designated proxy or legal guardian and the physician.
5. If the relevant parties agree that treatment should be limited, the physician shall write formal orders consistent with the limited treatment plan in the patient's medical record and note the patient's medical condition, other facts and considerations pertinent to the decision, and the nature of the discussion in the progress notes.

References

1. Composite definition from Hospital Administration Terminology, 1st Edition, American Hospital Association, 1982, p. 24; and Deciding to Forego Life Sustaining Treatment, Report of the President's Commission for the Study of Ethical Problems in Medicine, 1983, p. 181.
2. Deciding to Forego Life Sustaining Treatment, p. 181.
3. Micetich KC, Steinecker PH, Thomasma DC: Are intravenous fluids morally required for a dying patient? Arch Inter Med 143:977, 1983.

Resources

The Committee found the following resources particularly useful in the study of this issue:

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Wanzer SH, et al.: The physician's responsibility toward hopelessly ill patients. New Eng J Med 310:955-959, 1984.

This paper is submitted by the MMA Committee on Ethics and Medical-Legal Affairs:

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Allegation

Delay in diagnosing lung cancer.

Facts

The patient, a 67-year-old male, presented to the clinic on September 7, 1982, because of irritability and chronic diarrhea. His past medical history was significant for mild diabetes, hypertension, supraventricular tachycardia, and hemorrhoids. He was examined by Dr. X and instructed to return the following day for laboratory studies and chest X-ray. The patient returned on September 8 as scheduled. Laboratory test results were reported as normal. The chest X-ray was reported as showing a large mass in the right lobe, most likely representing carcinoma of the lung.

According to Dr. X, the patient was instructed to return for a follow-up examination to review the test results. Because of a failure in the dictation equipment, no dictation for the visit was ever transcribed, and the follow-up instruction was not contained in Dr. X's hand-written note. The patient did not return for follow-up. The chest X-ray report was apparently filed without being brought to the attention of Dr. X. Therefore, the abnormal findings were not noted by Dr. X nor communicated to the patient.

In mid-January, 1983, the patient experienced back pain while vacationing in Florida. A compression fracture of T9 was diagnosed and the patient was referred to an orthopedist. He was seen on February 25, 1983, and given a brace and medication. Because the pain persisted, the patient was admitted to the hospital on March 23, 1983, for further diagnostic studies. During this hospitalization, a chest X-ray was taken which showed a large pulmonary mass that had metastasized to the ribs and spine. The patient was started on palliative radiation, but his condition deteriorated rapidly, and he died on April 25, 1983. The patient's wife filed a lawsuit against Dr. X and the clinic alleging failure to diagnose and treat the lung cancer in a timely manner.

Disposition

After negotiations with the claimant's attorney, this case was settled for $10,000.

Reasons for Settlement

The six-month delay in diagnosing the patient's lung cancer was clearly the result of failure to review and take action on the abnormal chest X-ray findings. Damages were mitigated, however, by an oncologist's opinion that even if the diagnosis had been made in September of 1982, the outcome would not have changed significantly because of the advanced state of the malignancy at that time.

Risk Management Comments

This case arose because of a breakdown in the clinic's system, which allowed an abnormal X-ray report to be filed without review by the physician. Such errors can be prevented by enforcement of a policy that lab and X-ray reports will not be filed until the physician initials and dates the report. All reports should be given to the physician along with the chart to ensure that results are reviewed and appropriate follow-up action taken. The physician's initials and the date will provide evidence that such action has been taken.

Another issue in this case was the patient's contributory negligence in failing to return for the follow-up appointment. According to Dr. X, the patient was instructed to return in a week to review the test results. However, this instruction was not documented in the chart, apparently because of a mechanical failure in the dictation equipment, resulting in no dictation for the patient's visit. Thus, the patient's failure to return as instructed would have been extremely difficult to raise as a defense in this case. To ensure that all dictation is completed, the physician should keep a list of all patients seen during the day. This list should then be given to the transcriptionist so that the names can be checked off as the transcription is completed. If the dictation for a particular patient is missing, this can be brought immediately to the physician's attention so the note can be redictated. Such a procedure will help to ensure that dictation is not lost due to equipment failures or overlooked because the physician simply forgot to dictate on a particular patient.

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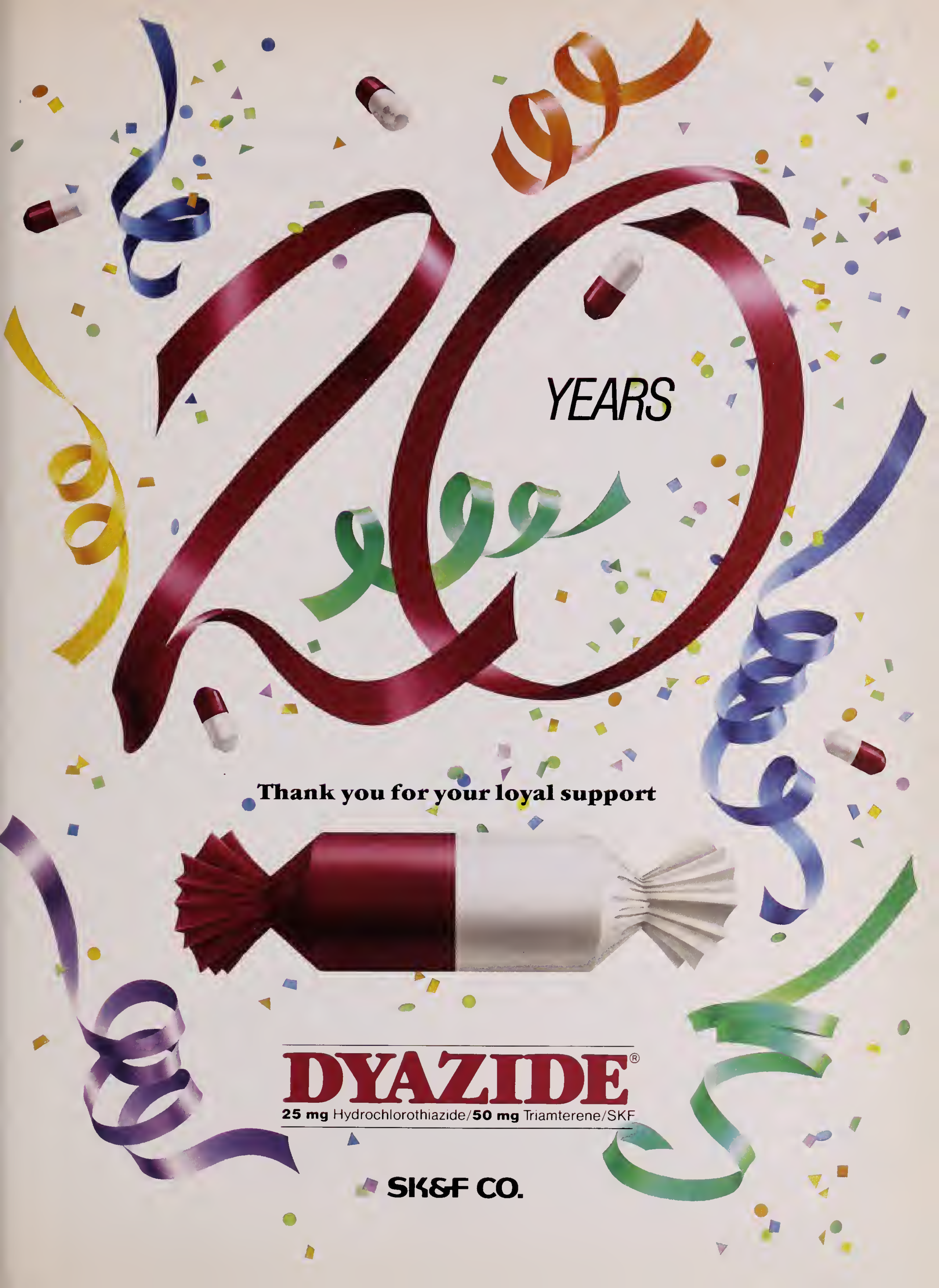

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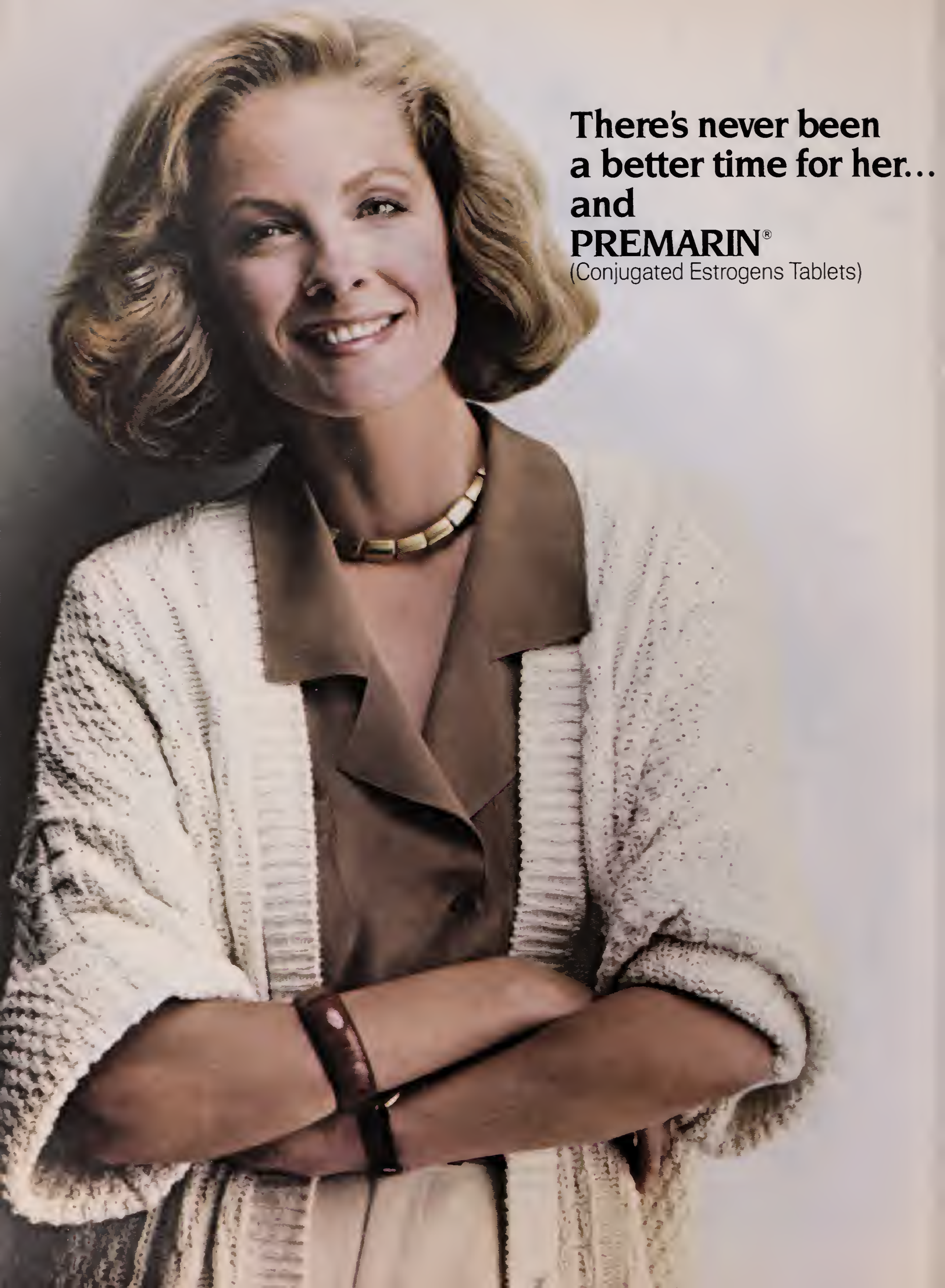
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PREMARIN used alone does not adversely affect lipid levels. In fact, a clinical study has shown a significant increase in HDL cholesterol—from 49.7 mg/dL to 56.4 mg/dL—and decrease in LDL cholesterol—from 165.1 mg/dL to 138.1 mg/dL—after one year of therapy with PREMARIN, 0.625 mg.[5]

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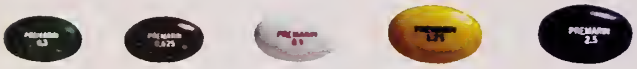

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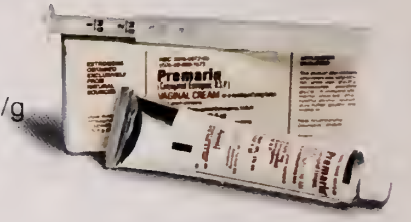

BRIEF SUMMARY *(FOR FULL PRESCRIBING INFORMATION AND PATIENT INFORMATION, SEE PACKAGE CIRCULARS.)*

PREMARIN® Brand of conjugated estrogens tablets, USP
PREMARIN® Brand of conjugated estrogens Vaginal Cream in a nonliquefying base

1. ESTROGENS HAVE BEEN REPORTED TO INCREASE THE RISK OF ENDOMETRIAL CARCINOMA.

Three independent case control studies have reported an increased risk of endometrial cancer in postmenopausal women exposed to exogenous estrogens for more than one year. This risk was independent of the other known risk factors for endometrial cancer. These studies are further supported by the finding that incidence rates of endometrial cancer have increased sharply since 1969 in eight different areas of the United States with population-based cancer reporting systems, an increase which may be related to the rapidly expanding use of estrogens during the last decade. The three case control studies reported that the risk of endometrial cancer in estrogen users was about 4.5 to 13.9 times greater than in nonusers. The risk appears to depend on both duration of treatment and on estrogen dose. In view of these findings, when estrogens are used for the treatment of menopausal symptoms, the lowest dose that will control symptoms should be utilized and medication should be discontinued as soon as possible. When prolonged treatment is medically indicated, the patient should be reassessed on at least a semiannual basis to determine the need for continued therapy. Although the evidence must be considered preliminary, one study suggests that cyclic administration of low doses of estrogen may carry less risk than continuous administration; it therefore appears prudent to utilize such a regimen. Close clinical surveillance of all women taking estrogens is important. In all cases of undiagnosed persistent or recurring abnormal vaginal bleeding, adequate diagnostic measures should be undertaken to rule out malignancy. There is no evidence at present that "natural" estrogens are more or less hazardous than "synthetic" estrogens at equiestrogenic doses.

2. ESTROGENS SHOULD NOT BE USED DURING PREGNANCY.

The use of female sex hormones, both estrogens and progestogens, during early pregnancy may seriously damage the offspring. It has been shown that females exposed in utero to diethylstilbestrol, a non-steroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated as not greater than 4 per 1,000 exposures. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have vaginal adenosis, epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether they are precursors of malignancy. Although similar data are not available with the use of other estrogens, it cannot be presumed they would not induce similar changes. Several reports suggest an association between intrauterine exposure to female sex hormones and congenital anomalies, including congenital heart defects and limb reduction defects. One case control study estimated a 4.7-fold increased risk of limb reduction defects in infants exposed in utero to sex hormones (oral contraceptives, hormone withdrawal tests for pregnancy, or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb reduction defects in exposed fetuses is somewhat less than 1 per 1,000. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well controlled studies that progestogens are effective for these uses. If PREMARIN is used during pregnancy, or if the patient becomes pregnant while taking this drug, she should be apprised of the potential risks to the fetus, and the advisability of pregnancy continuation.

DESCRIPTION: PREMARIN (conjugated estrogens, USP) contains a mixture of estrogens, obtained exclusively from natural sources, blended to represent the average composition of material derived from pregnant mares' urine. It contains estrone, equilin, and 17α-dihydroequilin, together with smaller amounts of 17α-estradiol, equilenin, and 17α-dihydroequilenin as salts of their sulfate esters. Tablets are available in 0.3 mg, 0.625 mg, 0.9 mg, 1.25 mg, and 2.5 mg strengths of conjugated estrogens. Cream is available as 0.625 mg conjugated estrogens per gram.

INDICATIONS AND USAGE: PREMARIN (conjugated estrogens tablets, USP): Moderate-to-severe *vasomotor* symptoms associated with the menopause. (There is no evidence that estrogens are effective for nervous symptoms or depression without associated vasomotor symptoms and they should not be used to treat such conditions.) **Osteoporosis (abnormally low bone mass).** Atrophic vaginitis. Kraurosis vulvae. Female castration.

PREMARIN (conjugated estrogens) Vaginal Cream is indicated in the treatment of atrophic vaginitis and kraurosis vulvae. PREMARIN HAS NOT BEEN SHOWN TO BE EFFECTIVE FOR ANY PURPOSE DURING PREGNANCY AND ITS USE MAY CAUSE SEVERE HARM TO THE FETUS (SEE BOXED WARNING).

Concomitant Progestin Use: The lowest effective dose appropriate for the specific indication should be utilized. Studies of the addition of a progestin for 7 or more days of a cycle of estrogen administration have reported a lowered incidence of endometrial hyperplasia. Morphological and biochemical studies of the endometrium suggest that 10 to 13 days of progestin are needed to provide maximal maturation of the endometrium and to eliminate any hyperplastic changes. Whether this will provide protection from endometrial carcinoma has not been clearly established. There are possible additional risks which may be associated with the inclusion of progestin in estrogen replacement regimens. (See PRECAUTIONS.) The choice of progestin and dosage may be important; product labeling should be reviewed to minimize possible adverse effects.

CONTRAINDICATIONS: Estrogens should not be used in women (or men) with any of the following conditions: 1. Known or suspected cancer of the breast except in appropriately selected patients being treated for metastatic disease. 2. Known or suspected estrogen-dependent neoplasia. 3. Known or suspected pregnancy (See Boxed Warning). 4. Undiagnosed abnormal genital bleeding. 5. Active thrombophlebitis or thromboembolic disorders. 6. A past history of thrombophlebitis, thrombosis, or thromboembolic disorders associated with previous estrogen use (except when used in treatment of breast or prostatic malignancy).

WARNINGS: Long-term continuous administration of natural and synthetic estrogens in certain animal species increases the frequency of carcinomas of the breast, cervix, vagina, and liver. There are now reports that estrogens increase the risk of carcinoma of the endometrium in humans. (See Boxed Warning.) At the present time there is no satisfactory evidence that estrogens given to postmenopausal women increase the risk of cancer of the breast, although a recent study has raised this possibility. There is a need for caution in prescribing estrogens for women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms. A recent study has reported a 2- to 3-fold increase in the risk of surgically confirmed gallbladder disease in women receiving postmenopausal estrogens.

Adverse effects of oral contraceptives may be expected at the larger doses of estrogen used to treat prostatic or breast cancer or postpartum breast engorgement, it has been shown that there is an increased risk of thrombosis in men receiving estrogens for prostatic cancer and women for postpartum breast engorgement. Users of oral contraceptives have an increased risk of diseases, such as thrombophlebitis, pulmonary embolism, stroke, and myocardial infarction. Cases of retinal thrombosis, mesenteric thrombosis, and optic neuritis have been reported in oral contraceptive users. An increased risk of postsurgery thromboembolic complications has also been reported in users of oral contraceptives. If feasible, estrogen should be discontinued at least 4 weeks before surgery of the type associated with an increased risk of thromboembolism, or during periods of prolonged immobilization. Estrogens should not be used in persons with active thrombophlebitis, thromboembolic disorders, or in persons with a history of such disorders in association with estrogen use. They should be used with caution in patients with cerebral vascular or coronary artery disease. Large doses (5 mg conjugated estrogens per day), comparable to those used to treat cancer of the prostate and breast, have been shown to increase the risk of nonfatal myocardial infarction, pulmonary embolism and thrombophlebitis. When doses of this size are used, any of the thromboembolic and thrombotic adverse effects should be considered a clear risk.

Benign hepatic adenomas should be considered in estrogen users having abdominal pain and tenderness, abdominal mass, or hypovolemic shock. Hepatocellular carcinoma has been reported in women taking estrogen-containing oral contraceptives. Increased blood pressure may occur with use of estrogens in the menopause and blood pressure should be monitored with estrogen use. A worsening of glucose tolerance has been observed in patients on estrogen-containing oral contraceptives. For this reason, diabetic patients should be carefully observed. Estrogens may lead to severe hypercalcemia in patients with breast cancer and bone metastases.

PRECAUTIONS: Physical examination and a complete medical and family history should be taken prior to the initiation of any estrogen therapy with special reference to blood pressure, breasts, abdomen, and pelvic organs, and should include a Papanicolaou smear. As a general rule, estrogen should not be prescribed for longer than one year without another physical examination being performed. Conditions influenced by fluid retention such as asthma, epilepsy, migraine, and cardiac or renal dysfunction, require careful observation. Certain patients may develop manifestations of excessive estrogenic stimulation, such as abnormal or excessive uterine bleeding, mastodynia, etc. Prolonged administration of unopposed estrogen therapy has been reported to increase the risk of endometrial hyperplasia in some patients. Oral contraceptives appear to be associated with an increased incidence of mental depression. Patients with a history of depression should be carefully observed. Preexisting uterine leiomyomata may increase in size during estrogen use. The pathologist should be advised of estrogen therapy when relevant specimens are submitted. If jaundice develops in any patient receiving estrogen, the medication should be discontinued while the cause is investigated. Estrogens should be used with care in patients with impaired liver function, renal insufficiency, metabolic bone diseases associated with hypercalcemia, or in young patients in whom bone growth is not complete. If concomitant progestin therapy is used, potential risks may include adverse effects on carbohydrate and lipid metabolism.

The following changes may be expected with larger doses of estrogen:

a. Increased sulfobromophthalein retention.

b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability.

c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by PBI, T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered.

d. Impaired glucose tolerance.

e. Decreased pregnanediol excretion.

f. Reduced response to metyrapone test.

g. Reduced serum folate concentration.

h. Increased serum triglyceride and phospholipid concentration. As a general principle, the administration of any drug to nursing mothers should be done only when clearly necessary since many drugs are excreted in human milk.

ADVERSE REACTIONS: The following have been reported with estrogenic therapy, including oral contraceptives: breakthrough bleeding, spotting, change in menstrual flow; dysmenorrhea; premenstrual-like syndrome; amenorrhea during and after treatment; increase in size of uterine fibromyomata; vaginal candidiasis, change in cervical erosion and in degree of cervical secretion; cystitis-like syndrome; tenderness, enlargement, secretion (of breasts); nausea, vomiting, abdominal cramps, bloating; cholestatic jaundice; chloasma or melasma which may persist when drug is discontinued; erythema multiforme; erythema nodosum; hemorrhagic eruption; loss of scalp hair; hirsutism; steepening of corneal curvature; intolerance to contact lenses; headache, migraine, dizziness, mental depression, chorea; increase or decrease in weight; reduced carbohydrate tolerance; aggravation of porphyria; edema; changes in libido.

ACUTE OVERDOSAGE: May cause nausea, and withdrawal bleeding may occur in females.

DOSAGE AND ADMINISTRATION:

PREMARIN® Brand of conjugated estrogens tablets, USP

1. *Given cyclically for short-term use only.* For treatment of moderate to severe *vasomotor* symptoms, atrophic vaginitis, or kraurosis vulvae associated with the menopause (0.3 to 1.25 mg or more daily). The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible. Administration should be cyclic (eg, three weeks on and one week off). Attempts to discontinue or taper medication should be made at three- to six-month intervals.

2. *Given cyclically.* Female castration. Osteoporosis. Female castration—1.25 mg daily, cyclically. Adjust upward or downward according to response of the patient. For maintenance, adjust dosage to lowest level that will provide effective control. Osteoporosis—0.625 mg daily. Administration should be cyclic (eg, three weeks on and one week off).

Patients with an intact uterus should be monitored for signs of endometrial cancer and appropriate measures taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding.

PREMARIN® Brand of conjugated estrogens Vaginal Cream

Given cyclically for short-term use only. For treatment of atrophic vaginitis or kraurosis vulvae.

The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible.

Administration should be cyclic (eg, three weeks on and one week off).

Attempts to discontinue or taper medication should be made at three-to-six month intervals.

Usual dosage range: 2 to 4 g daily, intravaginally, depending on the severity of the condition.

Treated patients with an intact uterus should be monitored closely for signs of endometrial cancer and appropriate diagnostic measures should be taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding.

References:

1. Whitehead MI, Townsend PT, Pryse-Davies J, et al: Effects of estrogens and progestins on the biochemistry and morphology of the postmenopausal endometrium. *N Engl J Med* 1981;305:1599-1605 **2.** Paterson MEL, Wade-Evans T, Sturdee DW, et al: Endometrial disease after treatment with oestrogens and progestogens in the climacteric. *Br Med J* 1980;280:822-824 **3.** Magos AL, Brincat M, Studd JWW, et al: Amenorrhea and endometrial atrophy with continuous oral estrogen and progestogen therapy in postmenopausal women. *Obstet Gynecol* 1985, 67: 496-499 **4.** Whitehead MI, Lane G, Siddle N, et al: Avoidance of endometrial hyperstimulation in estrogen-treated postmenopausal women. *Semin Reprod Endocrinol* 1983;1:1;41-52. **5.** Barnes RB, Roy S, Lobo RA. Comparison of lipid and androgen levels after conjugated estrogen or depo-medroxyprogesterone acetate treatment in postmenopausal women. *Obstet Gynecol* 1985,66:216-219

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

OCTOBER, 1986

15-18 **The 20th Annual Orthopaedic and Trauma Seminar** Hennepin County Medical Center; Pillsbury Auditorium, HCMC, 701 Park Avenue South, Minneapolis, Minnesota. CONTACT: Ramon B. Gustilo, M.D., or Carol Quinlivan, Orthopaedic Office 813, 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2812.

17 **Current Concepts in Cardiology of the Elderly** CME, Medical School, University of Minnesota; Pillsbury Auditorium, HCMC, 701 Park Avenue, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

17-18 **Office Management of Ear, Nose and Throat** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, 420 Delaware Street SE, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

17-18 **Current Clinical Cardiology for Physicans and the Fifth Annual Jesse E. Edwards, M.D., Lecture** United Hospital; The Landmark Center, St. Paul, Minnesota. CONTACT: Medical Staff Office, United Hospital, 333 North Smith Avenue, St. Paul, Minnesota 55102; (612) 298-8558.

18-19 **Update in Cardiology** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-22 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-24 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

22-24 **Obstetrics and Gynecology Annual Autumn Seminar** CME, Medical School, University of Minnesota; Marriott Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

23-25 **Emergency Medicine for Primary Care Physicians** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

24 **E.T. Bell Pathology Symposium** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

25 **Anatomic Pathology Tumor Seminar** Minnesota Society of Clinical Pathologists; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Teri Davids, Minnesota Medical Association, 2221 University Avenue SE, Minneapolis, Minnesota 55414; (612) 378-1875.

October 31 - November 1 **Primary Care Orthopedics** Park Nicollet Medical Foundation; Naegele Auditorium, Park Nicollet Medical Center, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Elaine Anderson, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3703.

NOVEMBER, 1986

1 **Minnesota Society of Anesthesiologists Fall Scientific Meeting** Minnesota Society of Anesthesiologists; L'hotel Sofitel, Bloomington, Minnesota. CONTACT: Douglas E. Koehntop, M.D., University Anesthesiologists, PA, Box 294, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 373-8826.

1 **4th Annual Clinical Review for Physicians—1986—Management of Far Advanced Heart Disease** Midwestern Heart-Lung Institute; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Wendy K. Wolf, Coordinator, 2545 Chicago Avenue, Suite 611, Minneapolis, Minnesota 55404; (612) 871-4771.

2 **ENT for Primary Care Physicians** Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

7 **Primary Care of Common Trauma Injuries** North Memorial Medical Center; North Memorial Medical Center, Robbinsdale, Minnesota. CONTACT: Allen VanBeek, M.D., 3366 Oakdale North, Suite 504, Robbinsdale, Minnesota 55422; (612) 588-0593.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

8-9 **Minnesota Society of Neurological Sciences 1986 Annual Scientific Meeting** Minnesota Society of Neurological Sciences; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Susan Anton-Johnson, Executive Secretary, 4225 Golden Valley Road, Minneapolis, Minnesota 55422; (612) 725-6767.

14 **Pediatric Orthopedics: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55404; (612) 874-5884.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

17-21 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

22 **Oncology Symposium** Metropolitan Medical Center; Metropolitan Medical Center, Minneapolis, Minnesota. CONTACT: Dan McGinty, 900 South 8th Street, Minneapolis, Minnesota 55404; (612) 347-4727.

23 **American College of Physicians, Minnesota Chapter, Regional Meeting** American College of Physicians; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, Minnesota. CONTACT: Alvin L. Schultz, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55404; (612) 347-2702.

DECEMBER, 1986

1-5 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

4-6 **Cardiopulmonary Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

5 **19th Annual Symposium on Obstetrics and Gynecology** North Memorial Medical Center; North Memorial Medical Center, Robbinsdale, Minnesota. CONTACT: Frank Czerniecki, M.D., 3366 Oakdale North, Suite 601, Robbinsdale, Minnesota. 55422; (612) 588-0703.

6 **Epilepsy Update** CME, Medical School, University of Minnesota; Radisson University Hotel; Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

JANUARY, 1987

January 25 - February 1, 1987 **Grenadines/Orinoco River Air/Sea Cruise** North Central Medical Conference; Aboard the Ocean Princess. CONTACT: North Central Medical Conference, 1845 Hampshire Avenue, Suite 200, St. Paul, Minnesota 55116; (612) 698-1888.

30 **Detection and Diagnosis of Substance Use Disorders** St. Paul-Ramsey Medical Center; St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

FEBRUARY, 1987

2-6 **Updates in Clinical Gastroenterology** Mayo Clinic/Mayo Foundation, Buena Vista Palace, Lake Buena Vista, Florida. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

6 **Burn Care Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

9-13 **Practical Concepts in Rheumatology and Musculoskeletal Disease** Mayo Clinic/Mayo Foundation; Sheraton Scottsdale, Scottsdale, Arizona. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnestoa 55905; (507) 284-2085.

13 **Minnesota Dermatological Society Melanoma Seminar and Winter Quarterly Meeting** Minnesota Dermatological Society; Hennepin County Medical Center, Minneapolis, Minnesota. CONTACT: J. Corwin Vance, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2332.

16-20 **Clinical and Laboratory Hematology: Current Issues** Mayo Clinic/Mayo Foundation; Maui Marriott, Lahaina, Maui, Hawaii. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

21-28 **Rheumatology Symposium VI** Minnesota Medical Association Subcommittee on Rheumatic Diseases; South Seas Plantation, Captiva Island, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

MARCH, 1987

4-5 **Drug Therapy Symposium VIII** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

4-7 **Fifth Annual Critical Care Conference** St. Paul-Ramsey Medical Center, Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

14-21 **Symposium on Sports Medicine** Minnesota Medical Association Subcommittee on Sports Medicine; Radisson Inn Maingate, (Orlando) Kissimmee, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

20-21 **Eighth Annual Occupational Medicine Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

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1986	
October 23-25	Emergency Medicine for Primary Care Physicians, St. Paul, MN
November 1	Bioethics Seminar: When is Limited Treatment the Best Treatment, St. Paul, MN
November 8	Neurology Update, St. Paul, MN
December 4-6	Cardiopulmonary Medicine, St. Paul, MN
1987	
January 30	Detection and Diagnosis of Substance Use Disorders, St. Paul, MN
February 6	Burn Care Update, St. Paul, MN
March 4-7	Fifth Annual Critical Care Conference, St. Paul, MN
March 20-21	Eighth Annual Occupational Medicine Update, St. Paul, MN
April 2-4	Strategies in Primary Care Medicine, St. Paul, MN
April 9-10	Obstetrics & Gynecology Update, St. Paul, MN

Information and registration: Continuing Medical Education, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; Phone 612/221-3992.

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Growing West Suburban Lake Minnetonka Clinic adding one full-time internal medicine physician. Multispecialty: Family Practice, Internal Medicine, OB/GYN, Surgery, Orthopedics, Urology, Ophthalmology, Optometry, Pediatrics. 16-physician clinic, three offices, quiet, rural area allowing easy access to downtown Minneapolis. Immediate interviewing. Forward CV to: Mound Medical Clinic, Ltd., 2208 Commerce Boulevard, Mound, Minnesota 55364. Attn: Diane Theis, Clinic Manager; (612) 472-1144. 2-11/86

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Advanced Cardiac Life Support Course Mercy Medical Center, Coon Rapids, Minnesota. Wednesday, November 12 and 19, 8 a.m. - 6 p.m. $175 for certification, $100 for recertification. Contact education services at (612) 422-4646. 1-10/86

Vacation Rentals Snowmass, Colorado: House, 3 bedrooms, 3 baths, fully equipped, 5 minutes from ski lifts. Rent direct from owner and save 35%. Write: R.N. Barr, M.D., 7301 Mission Road, Prairie Village, Kansas 66208; or call evenings (913) 649-1277. 1-10/86

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Family Physician: Join established group in one of America's leading metropolitan areas. Opportunities for full range of family medicine, obstetrics optional. Must be board certified or board eligible. Excellent facilities, comprehensive benefits, highly competitive earnings. Direct inquiries to: Gary Freeman, M.D., Department of Family Practice, GROUP HEALTH, INC., 2829 University Avenue SE, Suite 600, Minneapolis, Minnesota 55414. 1-10/86

Family Practice: Three-man primary care group in St. Louis Park needs to replace relocating physician. Growing active practice, no OB. Large geriatric patient caseload. Guaranteed salary and malpractice insurance provided. Please contact: Lynn Abrahamsen, Medical Resource Group, 2550 University Avenue West, #239N, St. Paul, Minnesota 55114; (612) 647-0003. 1-10/86

Psychiatrist: BC/BE psychiatrist needed by our 150-member multispecialty medical staff and hospital in St. Cloud, Minnesota. Outstanding opportunity to establish a private practice with immediate income of $72,000 for 15 hrs/wk as medical director of hospital-based outpatient mental health program. An active 53-bed mental health unit psychiatric staff consisting of 3 psychiatrists, 2 psychologists, social workers, mental health nurses, and ancillary staff provides excellent clinical support. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 6-3/87

Joint Business Venture Opportunity in Twin Cities for gastroenterologist or internist with subspecialty in gastroenterology. Contact: Jim Wicka, 427 Woodlawn Avenue, St. Paul, Minnesota 55105; (612) 893-6668. 1-10/86

Physician Needed for satellite clinic sponsored by local specialists in a large regional shopping center. Family Practice, Emergency Medicine, or Internist considered. Candidate must have a warm, caring personality. Compensation based on salary plus incentives and benefits. Located in Sioux Falls, South Dakota, population 100,000, 3-state regional medical center, outstanding quality of life with excellent school system, colleges, and recreational opportunities. Call or write: John Peckham, Administrator, Empire Medical Clinic, 1200 South Euclid, Sioux Falls, South Dakota 57105; (605) 335-3878. 1-10/86

Wanted: Board Eligible/Certified Internist for primary care clinic near 75-bed hospital. Ideal community of 20,000 with a business area of 60,000 centered in a four-season recreational area. Specialty medical services available locally. Incentive earnings plan, insurance, and retirement plans available. Contact: Dennis Knudson, Administrator, LP Medical Clinic, 820 9th Street North, Virginia, Minnesota 55792. 5-2/87

Position Available for Medical Officer whose major function is to review evidence and make determinations on entitlement of claimants to VA disability and death compensation and pension benefits. Position located in Veterans Administration Regional Office and Insurance Center, Federal Building, Fort Snelling, Minnesota 55111. 40-hour work week, starting annual salary $40,051. This is a Federal position. Contact: Lorraine McCawley, Room 470; (612) 725-4066. 1-10/86

Minnesota Family Practice Needed: one physician. Rural community mid-west Minnesota. Hospital-clinic-nursing home-based setting. Shared calls. Guaranteed income. Good specialty backup. For further information call: (612) 669-4421 or write: Community Memorial Hospital and Care Center, 812 10th Avenue, Clarkfield, Minnesota 56223. 2-11/86

Primary Care Physician: Opportunity for internist or family practitioner in north suburban area. Contact: Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, Minnesota 55429; (612) 533-8666. 3-12/86

Family Practice: Hastings Family Practice, PA, is looking for a female BC/BE FP to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send CV to: D.R. Eckes, M.D., 1280 Ninninger Road, Hastings, Minnesota 55033; or call (612) 437-8666. 3-12/86

Choice Downtown Medical Office to Share: Ideal for Internist or FP; (612) 224-7900. (R)

Unexpected Vacancy, Student Health Physician: Join seven other physicians serving 16,000 students. Pleasant setting, unique and challenging practice. Dedicated compatible staff. Nine-month academic year appointment plus negotiable summer work for additional compensation. Medical teaching appointment possibility. Write: Physician Recruitment Committee, Student Health Service, Washington State University, Pullman, Washington 99164-2302, before November 1, 1986. Washington State is an Equal Opportunity/Affirmative Action Employer. (R)

St. Peter, Minnesota: Available immediately. Position of senior staff physician to work with progressive and forward-looking staff and administration to meet the medical needs of the patients at St. Peter Regional Treatment Center. JCAH accredited. Delightful setting in the heart of the Minnesota River Valley. University town of 10,000, ten minutes from Mankato, and one hour from the Twin Cities. Salary range in high-60s to 70s for BC/BE according to experience with excellent fringe benefit package and an opportunity for expanding income through minimal call. An AA/EOE employer. For further information contact: S.K. McHutchison, M.D., Clinical Director, St. Peter State Hospital, 100 Freeman Drive, St. Paul, Minnesota 56082; (507) 931-7707. (R)

Family Physician wanted, board certified or eligible, to join three young family physicians in a growing family practice group. New facility. Northfield is a small attractive college town (St. Olaf and Carleton) and is less than one hour from the Twin Cities and Rochester. Contact: Kenneth Sansome, M.D., David Larson, M.D., or Mark Mellstrom, M.D., Family Physicians of Northfield, 505 West Woodley, Northfield, Minnesota 55057; (507) 663-1261. (R)

Physicians Needed Over 400 opportunities nationwide!! Call (612) 786-1929 or send CV to: Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. (R)

The University of South Dakota School of Medicine is seeking a board certified/eligible Internist to assist in the development and operation of a Women's Health Center. The position will include a university appointment as an assistant professor, involved in undergraduate and graduate training programs, as well as clinical activities with the Veterans Administration, ambulatory and inpatient care. Salary will be commensurate with credentials/experience. An excellent benefits package is included. For further information contact: Mary Ann Bauman, M.D., Assistant Professor, University of South Dakota School of Medicine, 2501 West 22nd Street, Sioux Falls, South Dakota 57105. (R)

Physician Practice Opportunities in the Chesapeake Bay or Tidewater Virginia area—especially attractive for physicians who would like to increase their fishing, powerboating, sailboating and other water-related activities from 3 to 4 months to 9 to 10 months per year and still live in an area with seasonal changes: spring flowers, sunny beaches, bright fall leaves, and winter snow. Medical Resources has been retained to conduct searches for: ENT/OTO, Family Practitioners, General Surgeon with thoracic and/or vascular training, GYN, Internal Medicine, IM/Cardio, IM/Gastro, IM/Pulmon, OB/GYN, Orthopedic Surgeons, Pediatricians, and Urologists. These are multispecialty group, partnership and solo practice opportunities with visit and moving expenses, substantial salary, compensation, and/or practice support packages provided. Specific example: Orthopedic Surgeon needed for 16-physician multispecialty group in 50,000 population service area. Current group ORS most anxious to add another. You could live on the Chesapeake Bay with boat at your door 15 minutes from clinic and 135-bed hospital, 40 minutes from 650,000 population metro area. All opportunities represent *needs*. You would be needed, not just the 8th, 17th, or 31st in your specialty. For further information please call collect: (301) 261-8622, or forward detailed CV to: David P. Harrison, President, Medical Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. All correspondence will be handled in a confidential manner. (R)

Physician Practice Opportunities - Birmingham, Alabama - Large multispecialty group seeking another OB/GYN, Family Practitioner, IM/Cardio, IM/Geriatric, and Emergency Medicine physicians. Visit expenses reimbursed. Call collect: (301) 261-8622 or forward detailed CV to: David P. Harrison, President, Medical Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. (R)

Good Samaritan Hospital is seeking a board eligible/certified Obstetrician/Gynecologist to join a well-established practice in Cincinnati. Excellent opportunity to practice quality medicine in a progressive, tertiary care teaching hospital with nationally recognized programs in medical education, residency training, and research. Contact: Recruitment Consultant Executive Offices, Good Samaritan Hospital, 3217 Clifton Avenue, Cincinnati, Ohio 45220. (R)

Family Practice: BC/BE Family Practitioner wanted to replace retiring third physician. Good practice potential and early partnership. Contact: Kathleen K. Simo, M.D., South Medical Clinic PA, 4310 Nicollet Avenue South, Minneapolis, Minnesota; (612) 827-3503. (R)

Internist needed for a busy, two-member practice in a community of 40,000 near Minneapolis, Minnesota. Competitive 1st year salary with incentive benefits and early partnership. Contact: Diagnostic Center, 304 Belle Avenue, Mankato, Minnesota 56001; (507) 388-1655. (R)

Green Bay, Wisconsin: 27-physician multispecialty group seeking BC/BE physicians in the following specialties: Family Practice, Ophthalmology, Dermatology, Plastic Surgery, Radiology, OB-GYN, Internal Medicine, and Pediatrics. Green Bay is a progressive community with an easy lifestyle, ample outdoor activities, excellent schools, and cultural activities. The Clinic offers competitive salary and excellent fringe benefits. Interested physicians please contact: W.J. Mommaerts, Administrator, West Side Clinic, sc, 1551 Dousman Street, Green Bay, Wisconsin 54303. (R)

Psychiatrist: An opening exists for a general psychiatrist with Hennepin Faculty Associates. Salary and benefits are generous. Requirements are: board eligibility, Minnesota licensure, and potential for appointment in the Department of Psychiatry at the University of Minnesota. Position would be largely involved with inpatient care of acutely ill patients at Hennepin County Medical Center and/or Metropolitan Medical Center. This would be in association with over a dozen other full-time psychiatrists engaged in clinical care, teaching, research, and forensics. Contact: William W. Jepson, M.D., Chief of Psychiatry, Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, Minnesota 55415. Phone: (612) 347-5764. (R)

Board certified or eligible family physician needed for an established clinic of five family physicians. No OB. Located in northern suburb of Twin Cities. Call: Marv Brooks, M.D., or Merle Mark, M.D.; (612) 533-2721. (R)

Family Practice opportunity with a busy, growing practice of young physicians. We are looking for a fifth doctor to join our clinic in Northfield, Minnesota, an attractive college community 30 miles south of the Twin Cities. As a progressive, yet historic-minded town, Northfield has a lot to offer the young family. Please contact: James M. Evans, M.D., or Gretchen D. Ehresmann, M.D., 710 South Division, Northfield, Minnesota 55057; (507) 645-5646 or (612) 375-0311. (R)

Wisconsin BC/BE Pediatrician for established hospital practice in northwestern Wisconsin. Attractive area with abundant cultural and recreational opportunities, competitive salary and benefits. Contact: Raymond Wolf; (414) 784-3258. (R)

Lake Superior: BC/BE Internist needed to join 2 young, quality-oriented general internists in a growing active practice. Natural beauty, small-town environment with sophisticated 105-bed hospital on the south shore of Lake Superior. Excellent salary and benefits. Write: Minnesota Medicine (802), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

1987 CME Cruise/Conferences on Selected Medical Topics - Caribbean, Mexico, Hawaii, Alaska, China/Orient, Scandinavia/Russia. 7-14 days year round. Approved for 20-24 CME Cat. 1 credits (AMA/PRA) and AAFP prescribed credits. Distinguished professors. Fly roundtrip free on Caribbean, Mexican, and Alaskan Cruises. Excellent group fares on finest ships. Registration limited. Pre-scheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Avenue, Huntington Station, New York 11746; (516) 549-0869. (R)

General Internist: We are in need of a qualified internist, preferred board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic loacted next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write: James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072; (612) 245-2212. 7-12/86

Classified Advertisements

Family Practice— Associate needed to join four-man group, all ABFP, one member leaving soon due to health and family reasons. 65-miles north of Minneapolis, city of 2,200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact: Keith Clinic, PA, 160 SW Second Avenue, Milaca, Minnesota 56353; or call collect (612) 983-6101. 3-11/86

Family Practitioner needed to join a progressive 11-physician group. Liberal fringes and financial package. Thirty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. 4-12/86

General Internist to join our group of five family practitioners, one obstetrician, and one surgeon. We are located in a central Minnesota community of 9,000. Most aspects of internal medicine are available to this already established practice, including gastroscopy and invasive cardiovascular monitoring. Competitive salary with option to buy into group after one year. For information contact: Michael Neudecker, M.D., Medical Center PA; 209 First Street SE, Little Falls, Minnesota 56345; (612) 632-6611. (R)

Urologist Wanted: Board certified-board eligible needed to join a well established downtown practice in Minneapolis. Send CV to: Loren R. Keldahl, M.D., 825 South 8th Street, Suite 402, Minneapolis, Minnesota 55404. 4-12/86

Neurosurgeons: One or two American-trained, Board Certified/Eligible Neurosurgeons needed by our 150-member multispecialty (one neurosurgeon) Medical Staff and Hospital in St. Cloud, Minnesota. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

Neonatologist: Board Certified/Board Eligible American-trained Neonatologist needed to develop a Level III Nursery in Central Minnesota. Active support by 9-member Pediatric Department. Complete fully equipped Respiratory Department. Excellent Nursery Facility and Equipment. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

Physician Opportunities available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write: Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Physician or General Internist needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first-year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth, which provides excellent referral and continuing education resources. Call collect: (218) 834-2171, or write: Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

Lutsen Sea Villa: two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $85,000 - $80,000. Call: Jim (612) 333-8361. (R)

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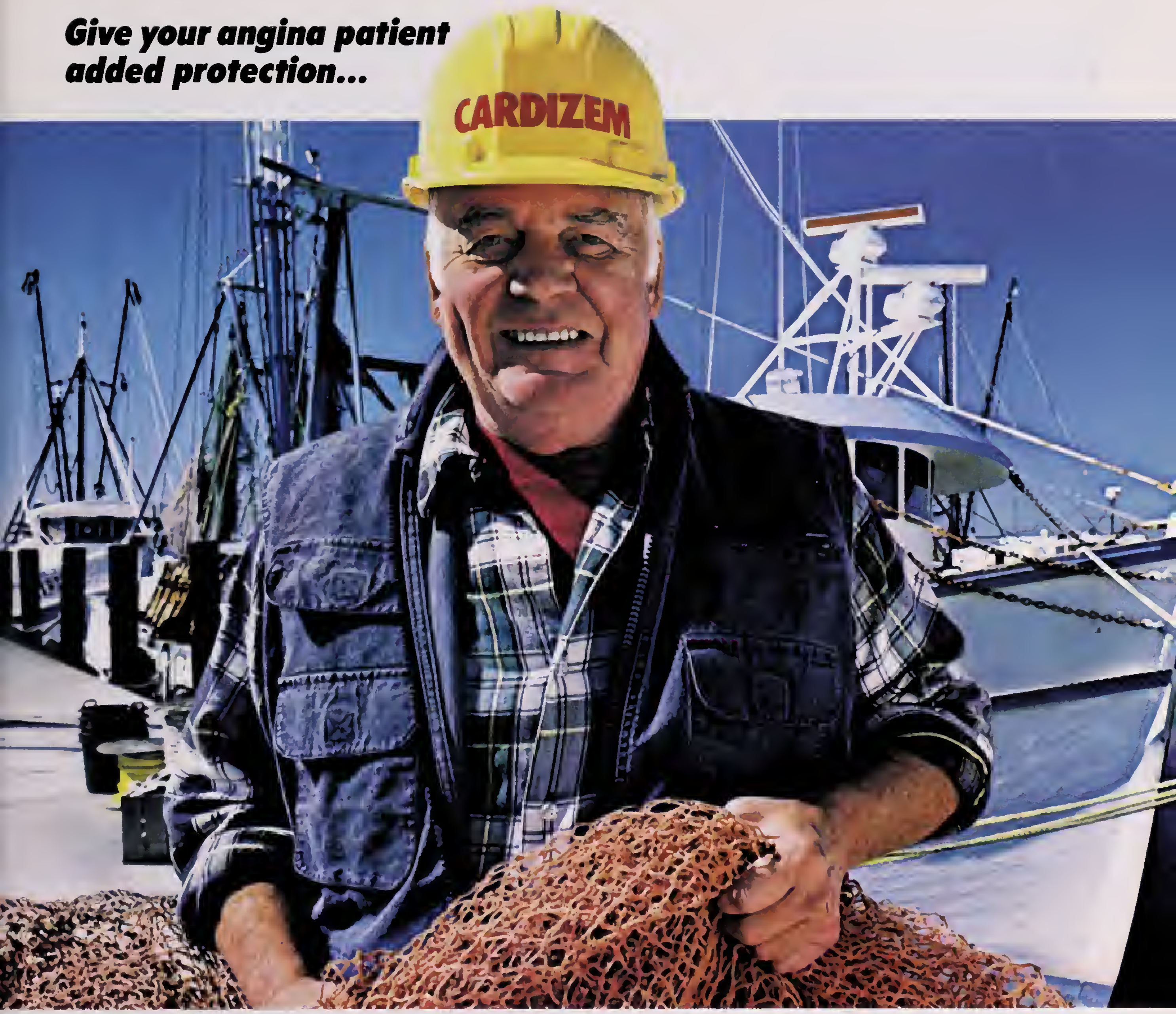

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***See Warnings and Precautions.**

Please see brief summary of prescribing information on the next page.

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CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1,243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt). An acute study of oral diltiazem in patients with impaired ventricular function (ejection fraction 24% ± 6%) showed improvement in indices of ventricular function without significant decrease in contractile function (dp/dt). Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is limited. Caution should be exercised when using the drug in such patients.
3. **Hypotension.** Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.
4. **Acute Hepatic Injury.** In rare instances, significant elevations in enzymes such as alkaline phosphatase, CPK, LDH, SGOT, SGPT, and other symptoms consistent with acute hepatic injury have been noted. These reactions have been reversible upon discontinuation of drug therapy. The relationship to CARDIZEM is uncertain in most cases, but probable in some. (See PRECAUTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity. There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality. These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. Diltiazem is excreted in human milk. One report suggests that concentrations in breast milk may approximate serum levels. If use of CARDIZEM is deemed essential, an alternative method of infant feeding should be instituted.

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy.

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established. The most common occurrences as well as their frequency of presentation are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%). In addition, the following events were reported infrequently (less than 1%):

Cardiovascular:	Angina, arrhythmia, AV block (first degree), AV block (second or third degree — see conduction warning), bradycardia, congestive heart failure, flushing, hypotension, palpitations, syncope.
Nervous System:	Amnesia, gait abnormality, hallucinations, insomnia, nervousness, paresthesia, personality change, somnolence, tinnitus, tremor.
Gastrointestinal:	Anorexia, constipation, diarrhea, dysgeusia, dyspepsia, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH (see hepatic warnings), vomiting, weight increase.
Dermatologic:	Petechiae, pruritus, photosensitivity, urticaria.
Other:	Amblyopia, dyspnea, epistaxis, eye irritation, hyperglycemia, nasal congestion, nocturia, osteoarticular pain, polyuria, sexual difficulties.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: alopecia, gingival hyperplasia, erythema multiforme, and leukopenia. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established. Issued 11/85

See complete Professional Use Information before prescribing.

References: 1. Frishman WH, Charlap S, Goldberger J, et al: Comparison of diltiazem and nifedipine for both angina pectoris and systemic hypertension. Am J Cardiol 1985;56:41H-46H. **2.** Weiner DA, McCabe CH, Cutler SS, et al: The efficacy and safety of high-dose verapamil and diltiazem in the long-term treatment of stable exertional angina. Clin Cardiol 1985;7:648-653. **3.** Pepine CJ, Feldman RL, Hill JA, et al: Clinical outcome after treatment of rest angina with calcium blockers: Comparative experience during the initial year of therapy with diltiazem, nifedipine, and verapamil. Am Heart J 1983;106(6):1341-1347. **4.** Cohn PF, Braunwald E: Chronic ischemic heart disease, in Braunwald E (ed): Heart Disease: A Textbook of Cardiovascular Medicine, ed 2. Philadelphia, WB Saunders Co, 1984, chap 39. **5.** McCall D, Walsh RA, Frohlich ED, et al: Calcium entry blocking drugs: Mechanisms of action, experimental studies and clinical uses. Curr Probl Cardiol 1985;10(8):6-80. **6.** Chaffman M, Brogden RN: Diltiazem: A review of its pharmacological properties and therapeutic efficacy. Drugs 1985;29:387-454. **7.** Schroeder JS: Calcium and beta blockers in ischemic heart disease: When to use which. Mod Med 1982;50 (Sept):94-116. **8.** Shapiro W: Calcium channel blockers: Actions on the heart and uses in ischemic heart disease. Consultant 1984;24(Dec):150-159. **9.** Johnston DL, Lesoway R, Humen DP, et al: Clinical and hemodynamic evaluation of propranolol in combination with verapamil, nifedipine and diltiazem in exertional angina pectoris: A placebo-controlled, double-blind, randomized, crossover study. Am J Cardiol 1985;55:680-687.

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Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Immediate Opening: Family Practitioner—River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes of the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman, or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona-based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years' experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

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Bemidji Clinic, Ltd. offers excellent opportunities for well-trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first-year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator, or N.A. Skogerboe, M.D., Medical Director; (218) 751-1280. (R)

Wanted: Family Practitioner—Ob/Gyn Group practice, central Minnesota. Starting salary $55,000. Write: Minnesota Medicine (755), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Practice: Northridge Family Medicine Clinic, PA, is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity serving a progressive rural health care community in South Central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, Minnesota. The hospital is well-equipped with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department, and well-equipped surgery department. Fairmont is unique with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, three golf courses, etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, Minnesota 56031. 2-11/86

Ob-Gyn needed for busy, modern practice with one female board certified OB-GYN in suburban St.

Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

FAMILY PRACTICE, INTERNAL MEDICINE, AND GENERAL SURGERY positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

FAMILY PRACTICE: Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic PA, 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

FAMILY PHYSICIAN needed to replace retiring partner in thriving 3-FP full-service practice in Starbuck, Minnesota, on the state's 13th largest lake. Good hunting and fishing. Modern 9-year-old hospital. Twenty miles to university campus. Call or write: Robert Bosl, M.D., Starbuck Clinic, PA, Starbuck, Minnesota 56381; (612) 239-2231. (R)

PHYSICIAN PRECEPTOR in Family Practice. Upper Peninsula Health Education Corporation is accepting applications for a full-time family physician in a unique, rural medical education center. Responsibilities are patient care including obstetrics and clinical instruction of medical students of the Upper Peninsula campus of Michigan State University's College of Human Medicine. Requirements are board eligibility or certification in family practice with a commitment to medical education. Salary and rank commensurate with experience. Send inquiries to: John Hickner, M.D., Bay de Noc Family Health Center, Doctors Park, Escanaba, Michigan 49829; (906) 786-9510. 4-11/86

FAMILY PHYSICIAN/EMERGENCY ROOM: Full-time salary working weekends, primarily emergency room. Flexibility available. Falls Medical Center, PA, 105 Shorewood Drive, International Falls, Minnesota 56649. Please contact: Douglas A. Johnson, M.D., or A. Marc Gorden, M.D., at (218) 283-9431 for more information. (R)

FAMILY PRACTITIONER: Due to death of partner, a family practitioner is needed to join two remaining family practitioners in busy rural practice 175 miles west of Twin Cities. Serious candidates may obtain details about practice and community by contacting: Robert Ross, M.D., or Ronald Beyer, M.D., at Northside Medical Center; (612) 839-2516 or Richard Slieter, Administrator, Ortonville Area Health Services; (612) 839-2502 or by writing to the above at 750 Eastvold Avenue, Ortonville, Minnesota 56278. (R)

GENERAL INTERNIST: The St. Cloud Medical Group located in Central Minnesota has an immediate opening for a general internist to join a 23-physician, multispecialty group in St. Cloud, Minnesota. The department of internal medicine currently has four board certified internists, and is in the process of recruiting an additional board certified internist to that department. This opportunity affords a general internist a great financial and working opportunity. St. Cloud is one of the fastest growing communities in the state of Minnesota and is home to three major colleges. It is geographically located to provide quick access to the Metropolitan Twin Cities area. The St. Cloud community has excellent school systems available to the individual physician and his or her family members. If interested in this excellent opportunity, please call collect either Dr. Ronald Elg and/or Daryl G. Mathews, Administrator, at (612) 251-8181, and/or send CV to: St. Cloud Medical Group, PA, 1301 West St. Germain Street, St. Cloud, Minnesota 56301. 4-11/86

Cover Photograph

Fall Maples

Paul M. Schollmeier, M.D., took the cover photograph while on a hike with his family south of Winona in Kipp State Park, which borders the Mississippi River. He used a Canon FTB with a 50 mm lens and Kodachrome ASA 64 film.

Dr. Schollmeier is a family practitioner with Blue Earth Medical Center in Blue Earth.

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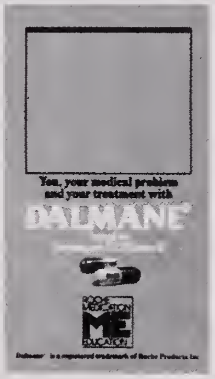
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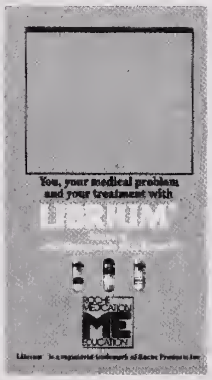
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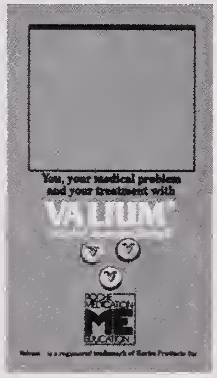
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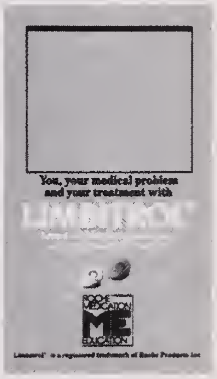
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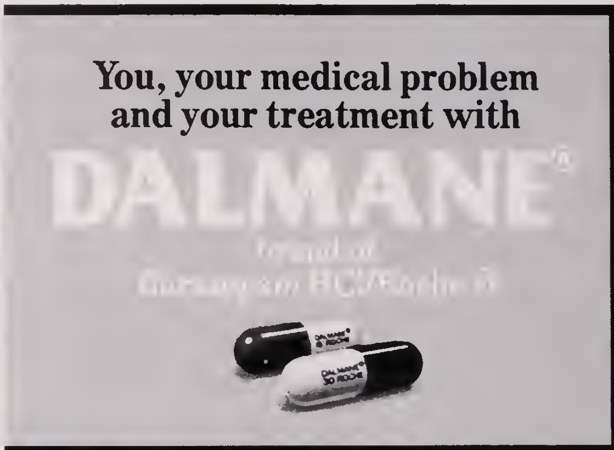
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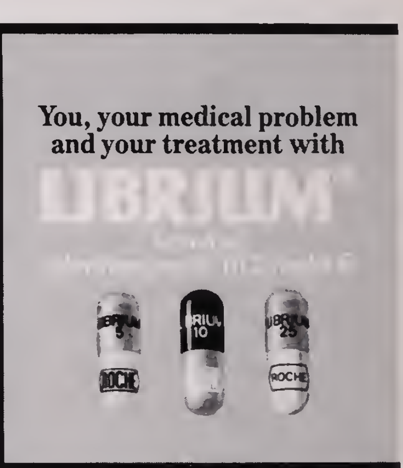
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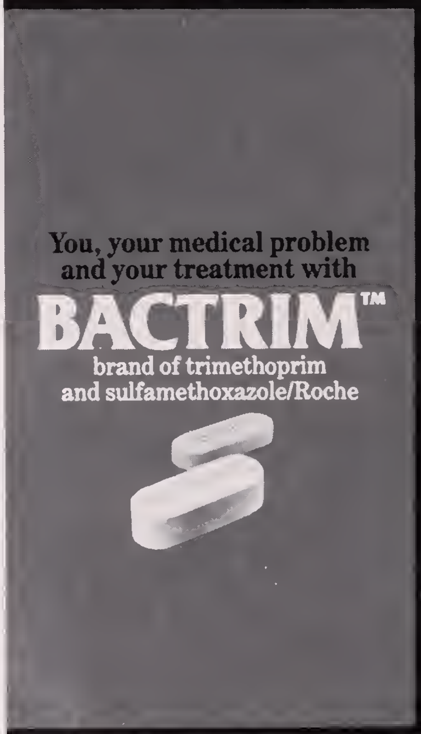
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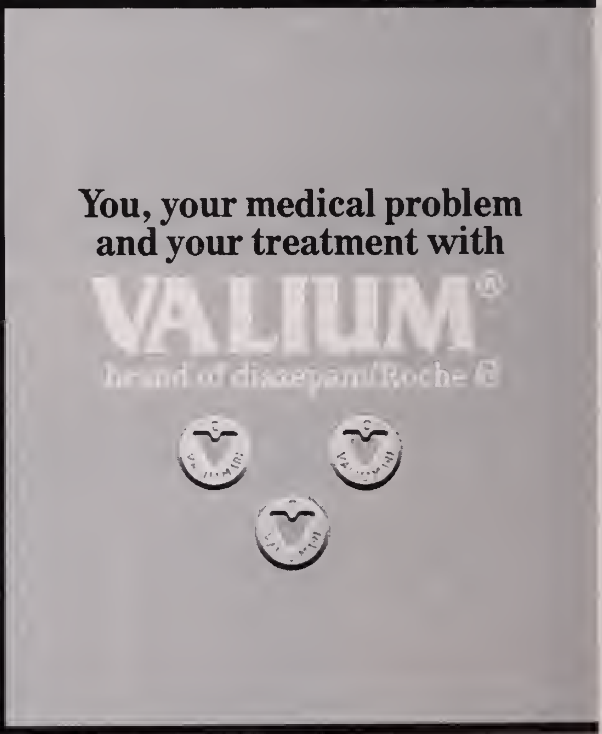
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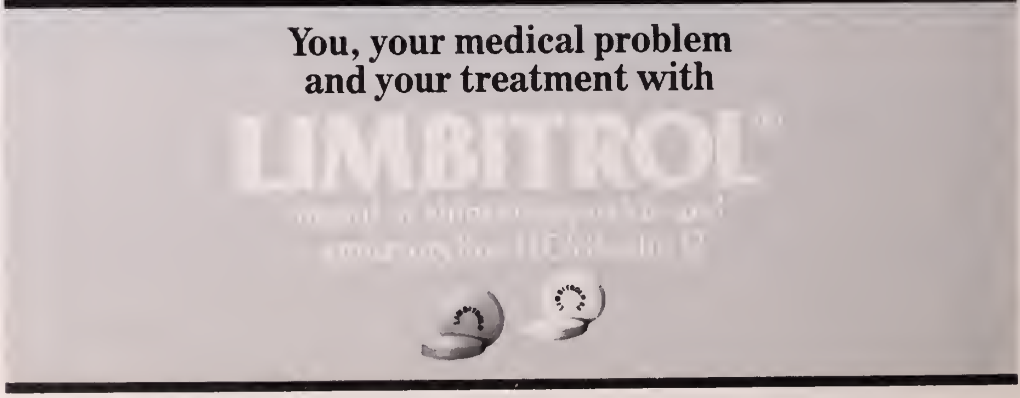
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* **WARNING**

> This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Contraindications: Concomitant use with other potassium-sparing agents such as spironolactone or amiloride. Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired.** If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K$^+$ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K$^+$ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possible exacerbation or activation of systemic lupus erythematosus has been reported with thiazide diuretics.

Precautions: The bioavailability of the hydrochlorothiazide component of 'Dyazide' is about 50% of the bioavailability of the single entity. Theoretically, a patient transferred from the single entities of triamterene and hydrochlorothiazide may show an increase in blood pressure or fluid retention. Similarly, it is also possible that the lesser hydrochlorothiazide bioavailability could lead to increased serum potassium levels. However, extensive clinical experience with 'Dyazide' suggests that these conditions have not been commonly observed in clinical practice. Angiotensin-converting enzyme (ACE) inhibitors can elevate serum potassium; use with caution with 'Dyazide'. Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids, and during concurrent use with amphotericin B or corticosteroids or corticotropin [ACTH]). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Cumulative effects of the drug may develop in patients with impaired renal function. Thiazides should be used with caution in patients with impaired hepatic function. They can precipitate coma in patients with severe liver disease. Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic and hemolytic anemia have been reported with thiazides. Thiazides may cause manifestation of latent diabetes mellitus. The effects of oral anticoagulants may be decreased when used concurrently with hydrochlorothiazide; dosage adjustments may be necessary. Clinically insignificant reductions in arterial responsiveness to norepinephrine have been reported. Thiazides have also been shown to increase the paralyzing effect of nondepolarizing muscle relaxants such as tubocurarine. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effects may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. Triamterene has been found in renal stones in association with the other usual calculus components. Therefore, 'Dyazide' should be used with caution in patients with histories of stone formation. A few occurrences of acute renal failure have been reported in patients on 'Dyazide' when treated with indomethacin. Therefore, caution is advised in administering nonsteroidal anti-inflammatory agents with 'Dyazide'. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine. Hypokalemia is uncommon with 'Dyazide', but should it develop, corrective measures should be taken such as potassium supplementation or increased dietary intake of potassium-rich foods. Corrective measures should be instituted cautiously and serum potassium levels determined. Discontinue corrective measures and 'Dyazide' should laboratory values reveal elevated serum potassium. Chloride deficit may occur as well as dilutional hyponatremia. Concurrent use with chlorpropamide may increase the risk of severe hyponatremia. Serum PBI levels may decrease without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. 'Dyazide' should be withdrawn before conducting tests for parathyroid function. Thiazides may add to or potentiate the action of other antihypertensive drugs. Diuretics reduce renal clearance of lithium and increase the risk of lithium toxicity.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances; postural hypotension (may be aggravated by alcohol, barbiturates, or narcotics). Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and respiratory distress including pneumonitis and pulmonary edema, transient blurred vision, sialadenitis, and vertigo have occurred with thiazides alone. Triamterene has been found in renal stones in association with other usual calculus components. Rare incidents of acute interstitial nephritis have been reported. Impotence has been reported in a few patients on 'Dyazide', although a causal relationship has not been established.

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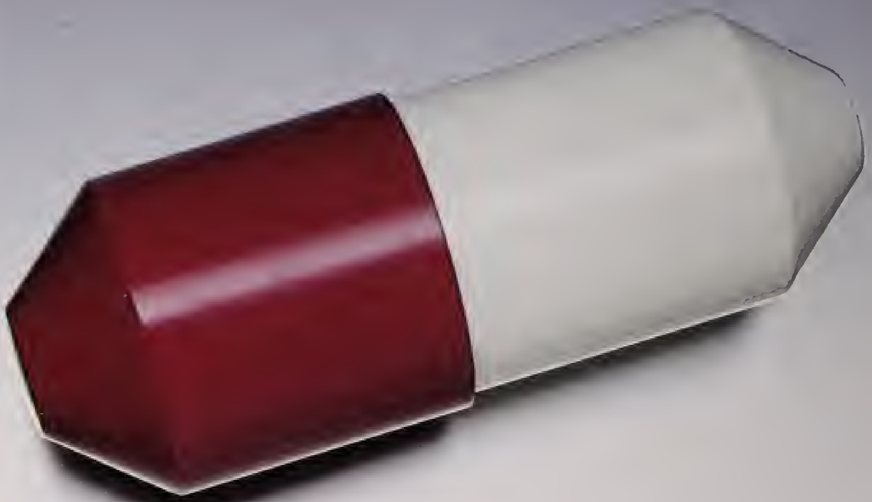

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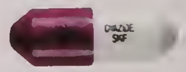

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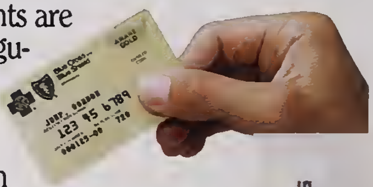

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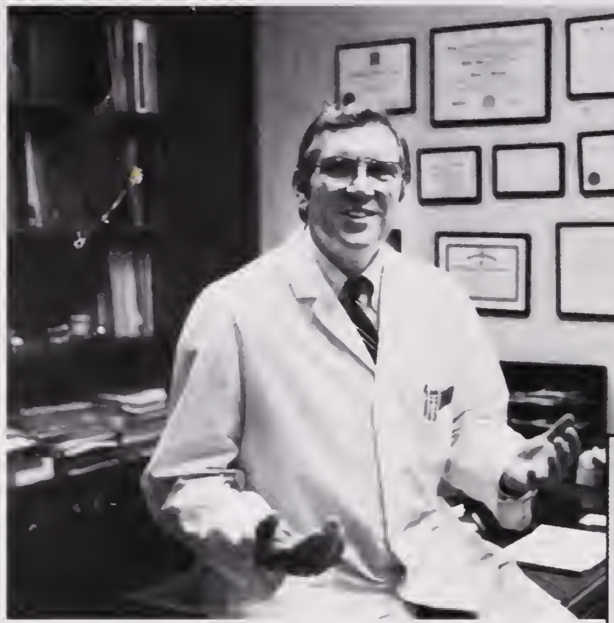

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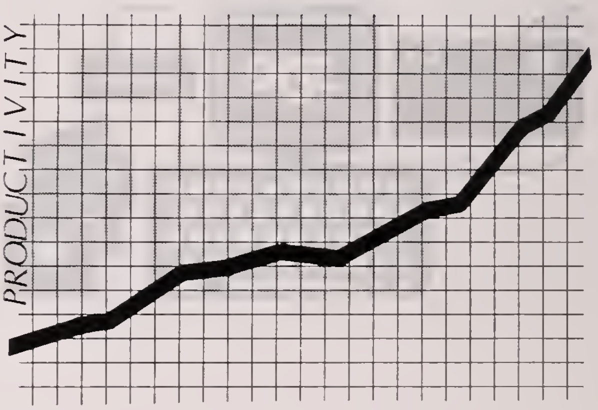

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President's Letter

Quality, Competition, and the Older Patient: The Blend Takes Extra Effort

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

Recently, senior citizens have been asking me the same question physicians have been asking themselves for the past 10 years: Can we keep the quality and cut the cost? The temptation to respond self-indulgently has eased with each response I've had to give. The public is concerned not with the trials and tribulations of physicians but with the question: Will *patients* continue to receive good health care? This is, and will continue to be, an overriding concern for the majority of our Medicare patients.

The somewhat standard answer I have developed for my public speaking engagements is one that I would hope all of my medical colleagues can endorse. In order to blend quality, cost control, and patients, great effort must be expended on the part of consumers/patients, third-party payers, physicians, and other providers. I believe most of that responsibility remains with the patient. (I'm one of those conservatives who still thinks that each person should bear the major responsibility for him or herself.)

The **patient** must become a smart buyer. That's the key to receiving top quality care in a competitive environment. This means that patients must learn ways to recognize quality and must know their rights. Last spring, the MMA produced a patient education piece, "Physicians & patients must talk openly with each other . . ." I'd recommend it as a handout. It offers tips on what is expected of both patient and physician.

The patient must also understand the process, becoming both price conscious and price shoppers. This means the patient must be willing to ask the cost of a procedure and make comparisons after also inquiring about outcomes and performance. How many have been done? What have been the results? and What is the cost? are questions we should encourage our patients to ask.

Then too, the patient must learn to recognize fraudulent health care and avoid it. Quackery is a $26 billion outrage in this country, and our patients are footing the bill. Our patients have to become sophisticated enough to understand that if it sounds too good to be true, it probably is. However, we can help them with this by encouraging them to talk with us about "home remedies," vitamin preparations, over-the-counter medications, nutrition supplements as well as the questionable treatments and procedures offered by the unscrupulous who prey on the elderly and uninformed. This is absolutely critical with our older patients. They need to understand why the so-called remedy may do more harm than good. We must explain this patiently and sympathetically.

Finally, the best way of reducing costs is preventing the problem. Senior citizens must understand that they have some control over their health care costs because they have control over their own behavior. Smoking cessation, exercise and weight control, restrained alcohol and drug use, proper nutrition, active social contacts, and appropriate periodic medical screening exams are all preventive steps these patients can take.

The responsibilities of **payers** are also critical if we are to maintain this delicately balanced blend. The payers must

1. Demand the best price with providers,
2. Limit administrative overhead, and
3. Develop and promote an outcome system analysis and use this in negotiations with providers.

The responsibility of **physicians** is consistent with what we learned in medical school. We must work harder at stressing prevention and take the time to discuss lifestyles with our patients. We also carry responsibility for helping to educate our patients on how to judge quality as it relates to cost. If we are not willing to do this, then we have no right to resent someone else's definition of quality.

Physicians *must initiate* discussions on outcomes and price comparisons. But a word of caution when working with older patients: Public relations experts tell us that older people have more desire to feel independent while at the same time they may become more confused and frustrated with decisions they must make. When discussing options with the senior population, a physician should clearly explain two or three of the best options rather than offer every statistic on various procedures and outcomes. Our patients are probably in our office because they trust us. As physicians, we must counsel them toward the best options without taking away their freedom to have the final say.

We as physicians must first look at ourselves to determine if we are meeting our responsibilities, then encourage both patients and payers to meet theirs—and be willing to work with them to make sure that we do continue to deliver the best of care to Minnesotans. I firmly believe that working together, senior citizens, payers, and physicians can restrain health care costs and maintain quality.

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Editor's Notebook

The Corporate Transformation of Medicine in Minnesota: Group Think—

An Interview with George Halvorson, President and Chief Executive Officer, and with Dr. Paul Brat, Medical Director, Group Health, Inc.

Twenty-first in a Series

MINNEAPOLIS - This is the fourth and concluding interview with leaders of major health care organizations. These leaders have included Andrew Czajkowski and his staff of Blue Cross and Blue Shield of Minnesota, Richard Burke of United HealthCare, Dr. Glen Nelson of American MedCenters, and now George Halvorson and Dr. Paul Brat of Group Health, Inc.

Much has happened since I initiated these interviews in March 1986. Blue Cross and Blue Shield has seen its AWARE GOLD enrollees grow to over 250,000 and has started its SENIOR GOLD program; United HealthCare has witnessed unprecedented growth of its national HMO chain and of its locally managed flagship HMO, Physicians Health Plan; American MedCenters has agreed to be acquired by Partners International of Irving, Texas, and Dr. Glen Nelson has resigned to become a senior vice-president of Medtronics, Inc.; and Group Health has seen its growth rates slowed—with a plateauing of its enrollment, the departure of its former president, Leonard Schaeffer, to become head of Blue Cross of California, and the arrival of its new president, George Halvorson, who has held previous high-level positions with Blue Cross and Blue Shield of Minnesota and the Health Central health system.

This interview took place at the Group Health headquarter's building on University Avenue in Minneapolis. Paradoxically, this building is just a few blocks from the Health Associations Building, home of the Minnesota Medical Association. I say paradoxically because in its formative days in the late fifties Group Health was considered anathema to organized medicine.

But the time and trends have moved Group Health well into the mainstream of medicine in Minnesota. Its physician members now admit to 19 hospitals and practice at 39 different sites.

I won't prejudge or prejudice your reading of this interview. But one thing struck me: Group Health leaders were delighted to have the opportunity to discuss their organization in the pages of *Minnesota Medicine*.

REECE: Mr. Halvorson, you came to Group Health three weeks ago as chief executive officer. Could you tell us something of your background before you assumed this position?

HALVORSON: I have been working in health care financing since 1968. I started with Blue Cross and Blue Shield and spent a number of years with them—moving from communications to planning, to management of their subsidiary companies—including HMO Minnesota. At the time I was assigned to manage HMO Minnesota, Blue Cross and Blue Shield was debating whether or not HMOs were going to survive. HMO

Minnesota at that point had about 200 participating physicians and a couple of thousand enrollees, most of them Blue Cross and Blue Shield employees. It, frankly, wasn't doing very well in the marketplace. We ended up doubling its size for several consecutive years until we had more than 70,000 members.

REECE: When did you leave Blue Cross?

HALVORSON: About four years ago. When HMO Minnesota grew to 70,000 people, I was promoted from head of the HMO to Senior Vice President of Marketing for Blue Cross and Blue Shield. Blue Cross and Blue Shield at that time was losing contracts rapidly. Groups were cancelling at twice the rate that they were being sold, and the HMOs were carving big chunks out of the existing groups. I was given an opportunity to take some of the same concepts that we used in HMO Minnesota and apply them to Blue Cross and Blue Shield. That's when we began taking advantage of the more rudimentary cost containment mechanisms of an HMO, and applying them to Blue Cross and Blue Shield programs. I preferred working with HMOs, however, so I moved to the Health Central System, where I was President and CEO of Senior Health Plan, a cooperative venture between Health Central, St. Paul-Ramsey Medical Center, and the Amherst-Wilder Foundation. I also directed HMO operations in several states for Health Accord, a subsidiary of Health Central.

REECE: I understand that you've written a book that's going to be published about cost containment. What is the name of the book and when will it be published?

HALVORSON: The book is called *Buyers Guide to Health Care Cost Containment*. Prentice-Hall is publishing it sometime this winter.

REECE: So you have a rich background in both indemnity insurance and the HMO system. I'm sure you will find this background useful at Group Health.

HALVORSON: I've had the unique and useful opportunity of working in both the fee-for-service side and the HMO side of health financing. It's been interesting to watch the ways in which HMO programs and fee-for-service programs are growing more similar as time goes on. There continue to be distinct differences, however.

REECE: I noticed the Minneapolis *Star and Tribune* August 11 edition contains a full-page ad on CareSpan. This is a joint plan offered by Group Health, Inc. and The Prudential Insurance Company, the biggest insurance carrier in America. The ad comments that CareSpan combines the strength and services of two health care leaders. This would seem to me to dovetail nicely with your indemnity and HMO experience. Could you tell us more about CareSpan?

HALVORSON: The beauty of the CareSpan plan is that it combines the cost effectiveness of a staff-model HMO with freedom of choice. People can choose the convenience of our multispecialty medical group practice setting with a higher benefit level, or they can choose to receive care from a non-HMO doctor. They have covered benefits in either case. So, basically, we allow the enrollee to make a choice of an HMO Plan or a fee-for-service plan on a per accident basis, rather than on an annual basis, as has been done in the past. What we have discovered is that people overwhelmingly choose to receive their care within our network rather than opt out of it.

REECE: How many years has this plan been in existence?

HALVORSON: CareSpan is a new product. But Group Health started the concept of an HMO/PPO combination about 25 years ago. The original program was called "Instant Choice." Maurice McKay, a pioneering giant in the HMO industry, came up with the idea in order to sell coverage to groups where the fee-for-service carrier would not allow Group Health to participate. He said, "We will offer you our HMO network and if somebody wants to go outside the network to receive care, we'll pay for that care, too—but at a lower benefit level." "Instant Choice" was very successful and took a lot of business away from the insurance companies in town. So Group Health has had some historical experience with the "freedom of choice" concept.

REECE: Group Health is known as a staff-model HMO. In about 1984 I believe, perhaps sooner, you began to add affiliated physician groups. Dr. Brat, perhaps you could comment on how many groups are affiliated and how they work.

BRAT: Until 1984, we were totally a staff-model HMO. We had all our own facilities, staffed by our physicians. In addition, of course, we have also always had a network of subspecialty referral physicians. We made the decision to affiliate with other high quality, primary care physician groups primarily to improve access. Our initial strategy was to go to periphery areas like Anoka and Stillwater, rather than build staff-model clinics in those areas. This strategy has worked very well. We now have 14 additional physician groups that we are currently affiliated with—a total of 39 sites in our system—and more than 600 physicians.

REECE: Was another part of your strategy to build pure staff-model outlets in sites like Calhoun Square and the Turner Building in downtown Minneapolis?

BRAT: Yes. Those are now staff-model clinics staffed by our salaried physicians.

REECE: How many of those staff locations have you recently added?

BRAT: Three clinics in the last two years.

REECE: Has the mix of permanently employed primary care versus specialty physicians varied over the years?

BRAT: We have always been predominantly a primary care group and we have approximately 160 primary care specialists on staff. We contract with other physicians for much of our specialty and subspecialty care, but we also have more than 30 subspecialists on staff in our group. We pay very competitively, and provide excellent benefits, and educational opportunities. Our goal is to recruit top-notch, board certified physicians in all areas.

REECE: How have your hospital affiliations changed over the last five years? You used to be primarily at Fairview-Riverside, but now you seem to have diversified.

BRAT: In the last several years—both to improve patient access, and because we selected hospitals for their high quality specialty areas—we have started using a greater number of hospitals.

HALVORSON: We use 19 hospitals, altogether. When we were looking for a place to do eye surgery, we chose Phillips Eye Institute because of its high quality. Similarly, we chose Metropolitan Medical Center for heart surgery. We're doing other surgery where we think the equipment and staff are the best available and where the services are most satisfying to our patients and physicians. We do more business with the University of Minnesota than any other HMO, for example.

REECE: Would you tell me more about your relationship with the University of Minnesota, and what type of patients go there. It's been my perception that you have the closest ties to the University of any HMO. Indeed, many of your physicians at Group Health are graduates of the University Medical School.

BRAT: A number of our physicians hold faculty appointments at the University, which we use very heavily for our tertiary care. For certain other services, such as GYN cancer, for example, we also use the University of Minnesota. All of our Pap smears are read by the University of Minnesota. Kidneys and transplants are done at the University. Urological surgery is done at Abbott-Northwestern. Our approach is to use the best facility available for each type of service.

REECE: There's been a move in town for the large corporations, such as Honeywell and Control Data, to go to self-funding and to write their own specifications for the kind of health care they want and also to narrow their choices of HMOs. How do you feel about this development? What impact does this have on Group Health?

HALVORSON: Some employers are becoming uncertain about whether HMOs are financially a good deal for them. As a result, they want utilization data from HMOs—rather than just a community rate. There is considerable legitimacy to their data requests. I wrote in the book you mentioned earlier that it makes sense for employers to ask for some key data and to have it. Corporations are spending a great deal of money on health care, and HMOs should be willing to tell them where and how it's being spent. Employers should have an opportunity to look at utilization data and make decisions about future relationships with HMOs based on true costs. I think that HMOs made a mistake in the past by not producing utilization data. We're in the process of putting appropriate systems in place so that we can share our data on both efficiency and quality of care.

REECE: Why did you come to Group Health?

HALVORSON: There were several things I liked about Group Health. One of them was that I've worked in a number of HMO and insurance settings—both in Minnesota and outside Minnesota—that involved either capitation, or IPA-model HMOs, or fee-for-service payments. A real concern to me—with all the kinds of incentives and cost controls that those models of reimbursement have to have—has always been quality assurance. The reason quality assurance is a concern is that any time money changes hands, incentives are created. It's just inevitable, it's part of being human.

HMOs, including the capitation models and the discount fee-for-service plans usually have programs that try to assume quality. But quality assurance approaches that are available to capitation and discount HMOs are very often arms length kind of mechanisms—often no better than fee-for-service insurance approaches. For example, it's hard for an IPA-model HMO or a fee-for-service insurance plan to do intensive patient chart review.

At Group Health, we have significantly more quality controls, because the staff-model HMO can do extensive and ongoing peer review. Our process is well established, it's documented; it's a review of peers by peers; and it not only picks up incidents, it also picks up patterns. Our physicians have an opportunity to see each other's patients and to review each other's charts.

We have a workable structure for identifying whether somebody is practicing medicine appropriately or not. There's also feedback from the referral doctors, from the surgeons who document in writing whether or not the diagnosis was accurate. This information all goes to the chief of the medical department and back to the original doctor so that there are constant and formal levels of feedback that rarely, if ever, exist in fee-for-service models.

REECE: Dr. Brat, maybe you can comment on the quality control process at Group Health. When was it established, and are the physicians pleased with it?

BRAT: Quality assurance has been going on for many years. Basically, we have three systems for assuring quality. One is who we hire and how we decide to keep them. When we hire a physician, he or she is interviewed by me, by the department head, by the chief of professional services at the clinic where the physician will be working and by at least one other physician in the department. There has to be a unanimous opinion that we want to hire that doctor. We require that our applicants be board certified, or in the process of certification.

They are then on probation for a two-year period and are monitored very closely during that time. After the two years, they are reviewed by an independent medical board that is chaired by Dr. Neal Gault, Dean Emeritus of the University's Medical School, and a group of outside physicians. The medical board reviews all physicians at the end of the two-year period and decides whether we should offer them a permanent appointment with Group Health.

REECE: What is the second type of quality assurance?

BRAT: The second type of quality assurance is a traditional system where the different medical departments set standards on how you should treat different disorders. For example, how often you should see a diabetic, what physical exams and lab tests you should do at each visit. They set standards and then we audit charts to see if the doctors are complying with those standards. A physician who is found not to be complying with those standards is brought to the attention of the medical department head.

Peer review is a third method. Basically, each individual within the department reviews every other person in the department. For instance, every internist reviews every other internist once a year. Also, specialists in the other departments review the internist to see whether referrals were worked up adequately before they go there. All of this is put in written form. Mainly it's from a competency point of view that we look at our colleagues—whether they are good doctors and whether members are satisfied with them. We also look at teaching appointments, committee involvement, and that type of thing. Then the department head sits down with each member in the department and discusses performance. This process is very well accepted by the physicians.

HALVORSON: One aspect I asked about before accepting this job was whether or not Group Health physicians have any kind of utilization-related financial incentives. I was pleased to learn that there are none. You may have heard in the community that there is some kind of internal, individual, utilization-based bonus arrangement for our physicians. There's nothing at all like that.

REECE: So physicians' annual salaries are based on the quality of their performance? Are you saying their incomes are not related to spending less per patient, to hospitalizing fewer patients, to ordering fewer tests, i.e., to underserving patients to make more money for themselves and Group Health?

BRAT: Our salaries are not tied to utilization. They are tied to quality—as judged by peers, patients, and results of the physician's practice. We believe that if you deliver quality care, that is the same as cost effective care. If you take care of cases efficiently and take care of them appropriately, that is cost effective care. Our physicians' salaries, incidentally, are much more competitive than most people know.

REECE: Are there any other myths you would like to dispel about Group Health for the reading audience?

HALVORSON: Yes—the myth that there is a large degree of non-medical management of the medical staff. That again is a complete myth. Everybody in medicine reports to Dr. Brat, including the clinic administrators and their staffs.

REECE: Dr. Brat, would you like to dispel further the myth that non-medical people are dictating how a physician should practice medicine?

BRAT: Yes. Many doctors I interview ask if there is going to be too much control over what they do. We really have fewer direct incident-by-incident control mechanisms over our doctors than any organization in town. For example, we do not require preadmission certification—we expect that our doctors are going to exercise good medical judgment. We do not require them to call a nurse to get approval before admitting a patient to the hospital.

REECE: So in essence, the doctors govern themselves. You're in control of what you want to be in control of?

BRAT: Right. We give physicians data to help them control themselves. But there are none of the very strict controls that you hear about with other organizations. It's interesting that freedom of choice HMOs require nurse approval for an admission. Group Health may be the only HMO where physicians are the only people involved in determining whether or not an admission is appropriate.

REECE: Are there any controls on how long the patient can stay in the hospital?

BRAT: Our doctors have established standards. Each medical department determines from the medical literature what they feel is an appropriate length-of-stay for a given disease or operation. Then each medical department head gets a daily computer printout. If a patient is in the hospital beyond the standard time, the doctor will be called and asked if there's something unusual about this case. If there is a complication, the prolonged stay is appropriate and if there's not, we'll ask more questions.

REECE: Let's wind this down and talk about each of your views of the future and how you see Group Health and its position in this environment.

HALVORSON: Basically, I think Group Health has erred a bit in the past couple of years by rising to the bait of trying to look like something other than what Group Health is. Group Health grew tremendously during a number of years by being exactly what it was—a good, solid staff-model HMO. It's a better and more convenient way of delivering health care. We are multi-service and multispecialty—with pharmacy, lab, X-ray all available at each site. Lately we've become more of an open choice plan with more sites and that is also a good approach. But convenient neighborhood access is not the main reason people buy coverage and receive care from Group Health. People receive care from Group Health because of the style of care—the team approach under one medical roof.

Another thing I see happening in the marketplace that will affect Group Health is that the fee-for-service plans are battling themselves into deep-discounted exhaustion. PHP and the Blues are both basically fee-for-service plans. PHP is trying to become increasingly cost competitive by selecting hospitals. They are now reserving the right to restrict access to certain specialists and hospitals. If you read their recent ads you'll notice a line across the bottom that heavily qualifies access.

At the same time, Blue Cross and Blue Shield is attempting to sell cost containment. They are also promoting their network, and they are writing business at hard-to-believe rates. The question to me is, which will run out first—the fee-for-service reserves, or the willingness of the fee-for-service doctors to grant major discounts?

REECE: I've had the impression that although Group Health has dropped in its enrollments that your financial situation is solid. Is that true?

HALVORSON: Yes, very solid. We're well-reserved, definitely in the black, and have no financial concerns. What we are doing right now is positioning ourself for the long-run in terms of product, pricing, and type of delivery of care.

REECE: Dr. Brat, how do you see the future?

BRAT: Well, the big emphasis in the future will be on the quality of care issue. The last few years have emphasized utilization and cost containment. Now people are worried about what is happening to quality. Group Health is very well-positioned, because we have an integrated system. Our competitors have a network of independent doctors offices all over the place, and it's very hard to find out what's going on in all those individual offices. Secondly, we are innovative about quality. We need to do a better job of getting our story out, because we are doing very good things to assure quality. If you take our obstetrics department, for example, we have the biggest group in the state. We deliver more than 300 babies per month and we have a certified obstetrician present at the hospital all the time, 24-hours-a-day, 7-days-a-week, monitoring patients so we can provide excellent care. We have a Preterm Birth Program, which has cut our rate of prematurity by 22 percent within the last year, and we were 30 percent better than the community average before we started the program.

REECE: Quality is an easy thing to admire. It's quite another to document. What you seem to be telling me is that staff-model HMOs are a good place in which to document quality because of the intimacy of the environment, the access to your data, and your knowledge of your own physicians.

BRAT: That's true, and I think we have to do a better job of telling the story about all the things Group Health is doing to benefit the people in the community.

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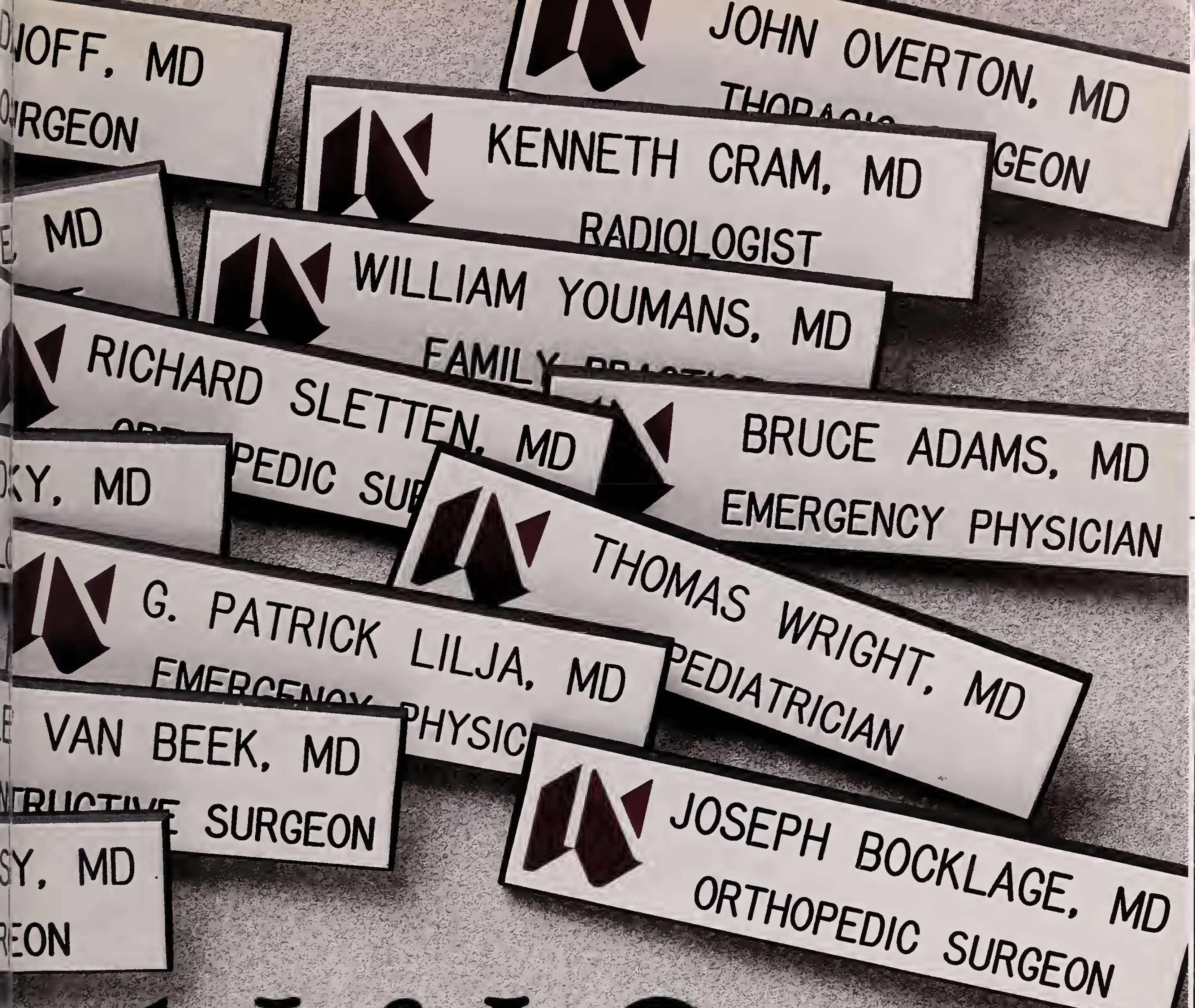
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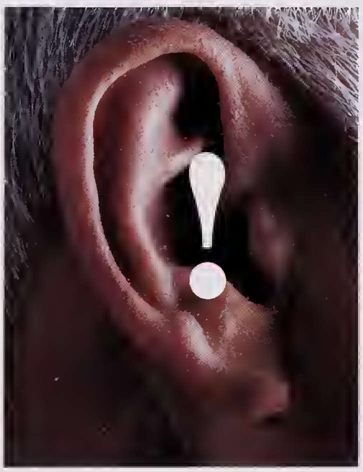

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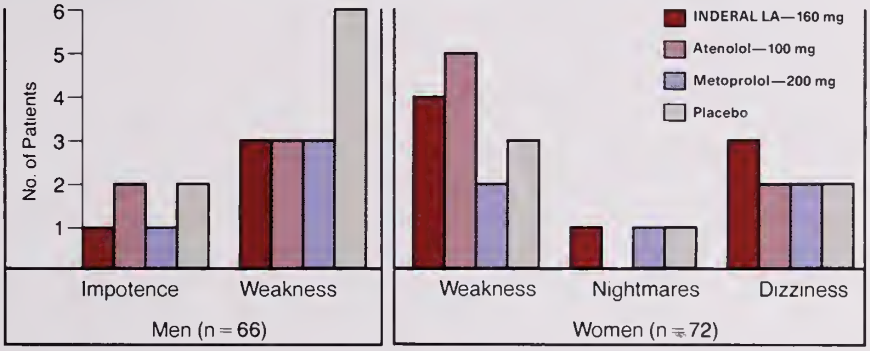

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MAJOR SURGERY The necessity or desirability of withdrawal of beta-blocking therapy prior to major surgery is controversial. It should be noted, however, that the impaired ability of the heart to respond to reflex adrenergic stimuli may augment the risks of general anesthesia and surgical procedures

Nonallergic Bronchospasm (eg, chronic bronchitis, emphysema)— PATIENTS WITH BRONCHOSPASTIC DISEASES SHOULD, IN GENERAL, NOT RECEIVE BETA BLOCKERS. INDERAL should be administered with caution, since it may block bronchodilation produced by endogenous and exogenous catecholamine stimulation of beta receptors

DIABETES AND HYPOGLYCEMIA Beta-adrenergic blockade may prevent the appearance of certain premonitory signs and symptoms (pulse rate and pressure changes) of acute hypoglycemia in labile insulin-dependent diabetes In these patients, it may be more difficult to adjust the dosage of insulin Hypoglycemic attacks may be accompanied by a precipitous elevation of blood pressure

Hydrochlorothiazide: Thiazides should be used with caution in severe renal disease In patients with renal disease, thiazides may precipitate azotemia In patients with impaired renal function, cumulative effects of the drug may develop

Thiazides should also be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma

Thiazides may add to or potentiate the action of other antihypertensive drugs Potentiation occurs with ganglionic or peripheral adrenergic-blocking drugs

Sensitivity reactions may occur in patients with a history of allergy or bronchial asthma

The possibility of exacerbation or activation of systemic lupus erythematosus has been reported

PRECAUTIONS

Propranolol hydrochloride (INDERAL® LA): GENERAL Propranolol should be used with caution in patients with impaired hepatic or renal function Propranolol is not indicated for the treatment of hypertensive emergencies

Beta-adrenoreceptor blockade can cause reduction of intraocular pressure. Patients should be told that propranolol may interfere with the glaucoma screening test Withdrawal may lead to a return of increased intraocular pressure

CLINICAL LABORATORY TESTS Elevated blood urea levels in patients with severe heart disease elevated serum transaminase alkaline phosphatase, lactate dehydrogenase

DRUG INTERACTIONS Patients receiving catecholamine-depleting drugs, such as reserpine should be closely observed if propranolol is administered The added catecholamine-blocking action may produce an excessive reduction of resting sympathetic nervous activity which may result in hypotension marked bradycardia vertigo syncopal attacks or orthostatic hypotension

CARCINOGENESIS, MUTAGENESIS, IMPAIRMENT OF FERTILITY Long-term studies in animals have been conducted to evaluate toxic effects and carcinogenic potential. In 18-month studies, in both rats and mice, employing doses up to 150 mg kg day there was no evidence of significant drug-induced toxicity There were no drug-related tumorigenic effects at any of the dosage levels Reproductive studies in animals did not show any impairment of fertility that was attributable to the drug

PREGNANCY Pregnancy Category C Propranolol has been shown to be embryotoxic in animal studies at doses about 10 times greater than the maximal recommended human dose There are no adequate and well-controlled studies in pregnant women Propranolol should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus

NURSING MOTHERS. Propranolol is excreted in human milk Caution should be exercised when propranolol is administered to a nursing mother

PEDIATRIC USE Safety and effectiveness in children have not been established

Hydrochlorothiazide: GENERAL Periodic determination of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals

All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance, namely: Hyponatremia, hypochloremic alkalosis, and hypokalemia Serum and urine electrolyte determinations are particularly important when the patient is vomiting excessively or receiving parenteral fluids Medication such as digitalis may also influence serum electrolytes Warning signs irrespective of cause are Dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue hypotension, oliguria, tachycardia and gastrointestinal disturbances such as nausea and vomiting

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or during concomitant use of corticosteroids or ACTH

Interference with adequate oral electrolyte intake will also contribute to hypokalemia Hypokalemia can sensitize or exaggerate the response of the heart to the toxic effect of digitalis (eg, increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content

Any chloride deficit is generally mild and usually does not require specific treatment, except under extraordinary circumstances (as in liver or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather appropriate therapy is water restriction rather than administration of salt, except in rare instances when the hyponatremia is life-threatening In actual salt depletion, appropriate replacement is the therapy of choice

Hyperuricemia may occur or frank gout may be precipitated in certain patients receiving thiazide therapy

Insulin requirements in diabetic patients may be increased, decreased, or unchanged Diabetes mellitus which has been latent may become manifest during thiazide administration.

If progressive renal impairment becomes evident, consider withholding or discontinuing diuretic therapy

Thiazides may decrease serum PBI levels without signs of thyroid disturbance

Calcium excretion is decreased by thiazides Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged thiazide therapy The common complications of hyperparathyroidism, such as renal lithiasis, bone resorption, and peptic ulceration, have not been seen. Thiazides should be discontinued before carrying out tests for parathyroid function

DRUG INTERACTIONS Thiazide drugs may increase the responsiveness to tubocurarine

The antihypertensive effects of thiazides may be enhanced in the postsympathectomy patient. Thiazides may decrease arterial responsiveness to norepinephrine This diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use

PREGNANCY Pregnancy Category C Thiazides cross the placental barrier and appear in cord blood The use of thiazides in pregnancy requires that the anticipated benefit be weighed against possible hazards to the fetus. These hazards include fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions which have occurred in the adult

NURSING MOTHERS Thiazides appear in human milk If use of the drug is deemed essential the patient should stop nursing

PEDIATRIC USE Safety and effectiveness in children have not been established

ADVERSE REACTIONS

Propranolol hydrochloride (INDERAL® LA): Most adverse effects have been mild and transient and have rarely required the withdrawal of therapy

Cardiovascular: Bradycardia congestive heart failure; intensification of AV block hypotension: paresthesia of hands, thrombocytopenic purpura, arterial insufficiency, usually of the Raynaud type

Central Nervous System. Lightheadedness, mental depression manifested by insomnia lassitude, weakness, fatigue; reversible mental depression progressing to catatonia, visual disturbances, hallucinations; an acute reversible syndrome characterized by disorientation for time and place; short-term memory loss, emotional lability slightly clouded sensorium and decreased performance on neuropsychometrics

Gastrointestinal Nausea, vomiting, epigastric distress, abdominal cramping diarrhea constipation, mesenteric arterial thrombosis, ischemic colitis

Allergic: Pharyngitis and agranulocytosis, erythematous rash; fever combined with aching and sore throat, laryngospasm and respiratory distress

Respiratory Bronchospasm

Hematologic Agranulocytosis nonthrombocytopenic purpura, thrombocytopenic purpura

Auto-Immune: In extremely rare instances, systemic lupus erythematosus has been reported

Miscellaneous Alopecia, LE-like reactions, psoriasiform rashes, dry eyes, male impotence; and Peyronie's disease have been reported rarely Oculomucocutaneous reactions involving the skin, serous membranes, and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol

Hydrochlorothiazide:

Gastrointestinal: Anorexia gastric irritation, nausea vomiting cramping diarrhea constipation, jaundice (intrahepatic cholestatic jaundice); pancreatitis, sialadenitis

Central Nervous System Dizziness, vertigo; paresthesias headache: xanthopsia

Hematologic. Leukopenia agranulocytosis, thrombocytopenia aplastic anemia

Cardiovascular: Orthostatic hypotension (may be aggravated by alcohol barbiturates or narcotics)

Hypersensitivity Purpura photosensitivity, rash, urticaria, necrotizing angiitis (vasculitis cutaneous vasculitis); fever respiratory distress, including pneumonitis, anaphylactic reactions.

Other Hyperglycemia, glycosuria, hyperuricemia, muscle spasm: weakness, restlessness, transient blurred vision

Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn

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Facilitating Physician Reporting of Child Abuse

ROBERT W. TEN BENSEL, M.D., MPH* and
MICHAEL WILCOX, M.D.†

It has been 23 years since Minnesota passed its first child abuse law. The increased numbers of reported cases, including cases involving the court system (18%), have placed more demands on physicians to interact with the juvenile and/or criminal justice systems.[1] Medical evidence is required in many cases to substantiate the presence of sexual abuse, physical abuse, medical neglect (Baby Doe), and gross emotional neglect such as Non-Organic Failure-To-Thrive.

In 1985 there were over 2 million reports of abused and neglected children. National data since 1976 have shown an increase in reported cases of 20% per year, or an incidence rate of 27.8 cases reported per 1000 children per year.[1] In Minnesota, 23,649 children were reported abused in 1984, up over 46% from 1983. Of these, 4,357 were sexual abuse cases (up 77% over 1983) 6,394 cases were child physical abuse cases (up 42%), and 7,870 were reported neglect cases (up 40%). Of the sexual abuse cases, only 49% were substantiated (confession, court action, or child protective services worker judged the child to be abused).[2]

Physicians' Attitudes Toward Reporting

Physicians' attitudes toward reporting are frequently discussed in the medical literature.[3] In Ohio, only 1.2% of referrals were made by private physicians in 1981. It is estimated that physicians in Minnesota report approximately 2%, reflecting the national norm. Reporting forms are suggested to ensure a uniform response to reporting and to provide both medically and legally correct information. These forms are available from the senior author[1*] and will be helpful in providing a uniform approach to collecting the major facts in the histories, physical findings, and assessments of these difficult cases.

Physicians' Attitudes in Performing a History and Physical Exam

The physician must maintain objectivity during the history and physical examination. Preface to the medical exam is to obtain relevant information, diagnose and treat any complications of abuse and neglect, and be emotionally supportive of the child and family who have been victimized. The physician needs to actively listen and observe, e.g., "spontaneous statements" of the child and caretaker. It is preferred that the parent or caretaker and child tell their own stories at their own pace and in their own manner. Leading questions that would suggest a definitive answer concerning what may have happened should be avoided. It is best to let this material flow in a more unstructured interview situation. It is easier for the physician to do a child abuse history and physical if the patient and family are known by the physician. The physician's role is not that of investigator or interrogator, but that of "witness," staying with the family even though the reporting process and possible court hearings may be very traumatic to all concerned.

A routine vaginal exam on prepubertal children is not recommended by most physicians. If there is a tear, laceration, or labial bruising that indicates there may have been penetration, then an additional examination may be required. Cowell makes the point that a good rectal with a manual examination will clarify most gynecological disorders in children and adolescents.[4]

Physician Assessment of the History and Medical Evidence

The physician should code out any physical harm in appropriate categories using the standard ICDA.[5] For cases where there may be no apparent injuries, the *Diagnostic and Statistical Manual of Mental Disorders* should be used.[6] The currently used diagnostic term for child abuse is a parent/child problem (V61.20). Non-Organic Failure-To-Thrive is referred to as a "reactive attachment disorder of infancy" (313.89), and incest or sexual abuse is one of the stressors that is recognized under the "post traumatic stress disorder" (309.81).

More and more physicians are being asked to render an opinion beyond their ordinary medical evaluations and reporting. The law does require a minimum for reporting of the name and address of the victim and the reporter's name and address. The new Minnesota State Law (§626.556, effective

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[1*] These forms include general child reporting forms (3 pages), specific forms for males who have been sexually abused (3 pages), specific forms for female victims (3 pages). These may be obtained by sending a self-addressed, stamped #10 envelope to Robert ten Bensel, M.D.

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8/15/85) has changed the criteria for reporting to require all physicians and other health professionals to report cases where "one knows or has reason to believe a child is being neglected or physicially or sexually abused . . . that person shall immediately report this information to the local welfare agency, police, or the county sheriff."[7] The change in the law dictates a higher standard of reporting; some evidence for making one concerned about the welfare of the child must now be shown. Physical evidence is helpful only in 4-20% of sexual abuse cases; therefore, the history of the child and caretaker are most often the basis for "knowledge to report."

At times, the local welfare department or police will request an opinion by the physician as to the reliability and validity of medical data and what type of risk or harm the abuse or neglect poses to the child. Technically, under the law, the assessment of risk is the responsibility of the police or sheriff's department and child protection services. Physicians must use their judgment, drawing upon their own experience and knowledge of their community, the child and family, etc., in providing this type of information over and above what is normally required during the reporting procedures.

Use of the Evidentiary Kit

Sexual assault evidentiary kits have been provided by the Bureau of Criminal Apprehension (BCA).[8] They are used approximately 300 times a year in Minnesota. Very few of the kits are used on children because they are useful only if three days or fewer have elapsed since an assault occurred. Consequently, their use is limited to cases of rape or sexual intercourse in which one is looking for physical evidence of ejaculation. When one suspects abuse of a prepubertal child, looking for pubic hair is of particular importance. The evidentiary kit yields hair in approximately 20% of the cases either upon a victim or upon the perpetrator. The BCA emphasizes that the physician make sure that the clothes the child was wearing during the alleged abuse be collected and bagged appropriately and transmitted to their lab. Police must take the kit's contents to the BCA to maintain the chain of evidence.

Medical evidence must be collected on both male and female sexual abuse victims. Most of the tests are aimed at gathering pubic hair and identifying the secretor (ABO) status of the victim and alleged perpetrator. If there is a history of ejaculation, one should use the dry swab, which collects the material for the tests for seminal fluid. Under no circumstances should a saline swab be used, as the sodium chloride content will inactivate the enzyme's activity. If there is suspected seminal fluid residue on the skin, one should use a swab moistened with sterile distilled water to remove this material. It is also critical that only the child or alleged perpetrator handles the gauze and place it in his or her mouth. If a physician's or other health professional's hands touch the gauze, their own secretor material on the skin may lead to contamination and make the test invalid.

Comments on the Examination of the Sexually Abused Child

A major issue regarding the victimized male is the assessment for alleged sodomy. The frequency of sexual abuse among male children may be as great as among females.[9] Venereal disease prototitis and anal/rectal tears are most often mentioned in the literature about sexual abuse among male children (outside of venereal diseases such as gonorrhea, herpes simplex type II, and syphilis). Normal anal tone in children is being evaluated by some researchers. The primary physician may wish to use consultation in evaluation of rectal lesions in both the male and female child. Cases have been reported where rectal bleeding has been caused by a polyp. The physician must remain objective until all the data is in and a complete history has been taken.

More literature on the sexually abused child is available.[10,11,12] For the pediatrician or family physician who is seeing children, John Huffman's book, *The Gynecology of Childhood and Adolescence* is essential.[12] This book is particularly valuable because it covers the examination of the normal child as well as the entire spectrum of disorders that affect the pre-pubertal and adolescent child. Huffman states that the normal introitus size is approximately 4 millimeters and no larger than 5 millimeters at age five. Cantwell has attempted to quantitate the size of the introitus with children who have been alleged sexual abuse victims.[13] She finds an approximate 75% correlation between an introitus of over 4 millimeters and positive findings of sexual abuse. At the present time, there are no definitive controlled studies on introitus size. It is recommended that the child be at ease with the examiner and that the introitus be horizontally measured. The vagina, like the penis, anus, and the mouth, is a dynamic physiological and anatomical structure that is highly dependent on mood, relaxation, and other physiological factors.

It is essential to inspect the external genitalia and perineum as part of every normal child exam to gain experience in observing what is normal. In this way one develops a sense of internal control based on an observational experience of normalcy, which can serve in comparison with a child who may be the victim of abuse. Huffman makes the point that every child should have a superficial external examination from birth and that parents should use anatomically correct terms with children as part of comprehensive health care. The physician is one of the few individuals who has legitimate access to the bodies of young children, and with the combined availability of the parent, is in a unique position to label things properly, to discuss sexuality, and to provide preventive information to both parents and children. A current study revealed that only 39% of pediatric housestaff examined female genitalia (84% examined male genitalia).[14]

Tanner has determined the stages of puberty for the male and female child, including pubic hair, genital characteristics and breast development in the female.[15] The Tanner staging can be used in an attempt to objectively assess the child's developmental status as an aid in helping the physician be more objective in his/her observations.

Summary and Conclusions

Every physician is involved directly or indirectly with the problems of child abuse and neglect. Continuing education regarding current issues and detection techniques is essential. The Academy of Pediatrics has an excellent training manual covering both child physical abuse and sexual abuse.[16] The child abuse reporting forms mentioned above are available to physicians and hospitals as a way of standardizing assessment of child neglect, as well as physical and sexual abuse of both male and female children. The individual physician does not need to investigate cases of child abuse and neglect beyond the normal history and physical exam required for patient care. Community multidisciplinary teams are present in 75 of Minnesota's 87 counties and are a good source of support for the individual practitioner. Consultation is encouraged for assessing difficult lesions of the anal/rectal or vaginal area.

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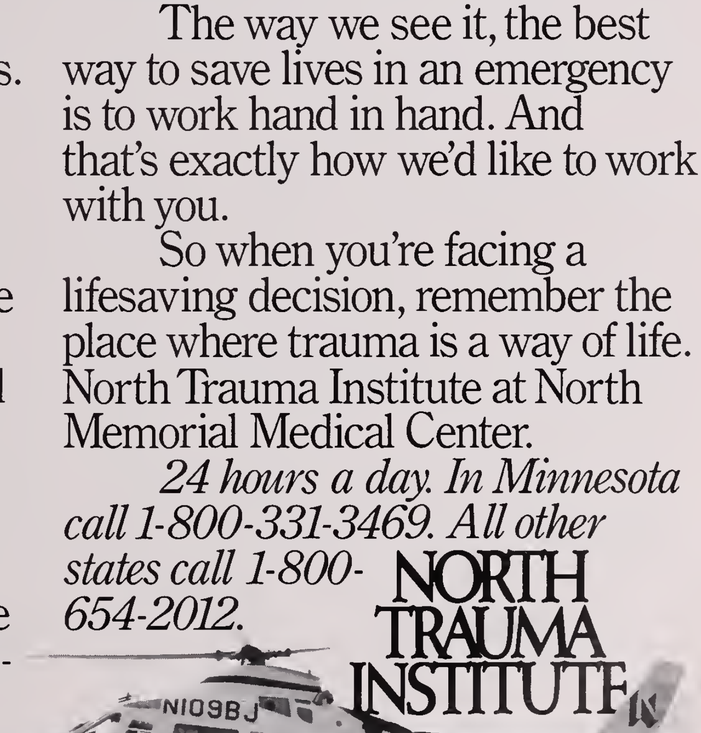

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A Study of the Type and Cost of Football Injuries

A Single Season in a Minnesota High School

ROBERT R. THOMPSON, M.D.*

A prospective study was done to determine the frequency, type, severity, and cost of injuries sustained by members of a single high school football team during one playing season (14 games). Twenty-four of 36 players sustained a total of 32 injuries. The higher than expected frequency is thought to be due to the fact that all injuries, no matter how minor, were recorded. Frequency rate for all injuries was 1 injury for each 151 hours of playing time. There were only 2 "serious" injuries (1 causing loss of more than 5 days and requiring consultation with a specialist or tertiary referral) for a serious injury rate of 1 injury for each 2,412 hours of playing time (games and practices). Twenty-one injuries occurred in games and 11 in practice sessions. Both major injuries were game related. Total cost of all injuries was $6,755 or $187.63 per player or $603.12 per hour of game time. Most common injuries were to the hand and wrist, and 5 of 32 (15.6%) injuries were to the head and neck.

Methods

During the 1985 football season the author attended all games of one Minnesota high school but not practice sessions. All game injuries were recorded and followed up. No charges were made for injuries that did not result in a visit to a physician's office. The charges recorded are only for those patients who were evaluated in the formal setting of an office or hospital and include physicians' fees, ambulance and hospital fees, X-rays, and physical therapy.

The use of 2 types of hinged knee orthoses was recommended at the start of the season, but purchase was voluntary. Three McDavid and 6 Donjoy brace pairs were used by 9 boys.

With the coaching staff's cooperation, the team physician (author) gave a pre-season talk to the parents on nutrition, dehydration, and philosophy of managing different types of injuries. Pre-practice and pre-game taping was carried out by an assistant coach and trainer. A registered physical therapist participated in the care of musculoskeletal injuries when appropriate. All participants were given a "sports physical" prior to the season as required by the Minnesota State High School League. When appropriate for various injuries, consultations were obtained from other medical specialties.

Results

Incidence of injury

There were a total of 32 injuries in 24 of 36 players. This represented 1 injury for each 151 player hours. A total of 231 player hours were lost because of injury.

Twenty-one injuries occurred in game play and 11 occurred in practice. Thus, there was 1 injury for 5.86 player hours of game time and 1 injury for 448 player hours of practice time.

Five injuries (15.6%) occurred on artificial (Astroturf) surface and 27 occurred on grass; only .02% of the hour season was spent on Astroturf.

Location of injuries

All 32 injuries, time lost from play, and cost of injury are shown in Table 1.

A summary of injuries by location is shown in Table 2.

Cost of injuries

The total cost of each injury is shown in Table 1. The total cost for all 32 injuries was $6,755.00. The average cost per injury was $211.09. The average cost per player was $187.63. These costs are summarized in Table 3.

Discussion

The 1985 football season was considered successful by this team's participants, coaching staff, parents, and fans. Due to this team's championship caliber its playing season was extended from the usual 8 games to 14 games. Throughout the season the injury rate was considered "lower than expected" by the coaching and training staff. Although it might be argued that the expanded game schedule increased the vulnerability to injury, it might also be reasonably advanced that the level of skill and conditioning decreased the likelihood of injury. In either case, the rate of injury per hour of practice and the types of injury should remain constant within the statistical variability.

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*Family practice; member, Interstate Medical Center; Chief of Staff, Zumbrota Community Hospital.

TABLE 1
Total injuries, time lost from play, and costs incurred

Injury	*Position*	*Time Lost*	*Cost*
Extensor strain, right wrist	E	2 days	$ 52.00
Back strain, suspected disc	RB	entire season	100.00
Wrist strain injury	T	2 days	68.00
Epiphyseal plate injury distal radius	T	10 days	74.00
Strain, PIP joint, hand	LB	None	46.00
Contusion, fibular head	RB	3 days	52.00
Meniscal tear, patellar dislocation*	RB*	1/2 game	4,750.00
Cervical strain	RB	2 days	69.00
Medial collateral ligament strain, knee	RB	2 weeks	87.00
Wrist strain	LB	3 days	.00
Rotator cuff sprain, reinjury	RB	3 days	46.00
Left bicepital tendon strain	RB	1/4 game	.00
Hyperextension strain of thumb	C	1/2 game	.00
PIP thumb strain injury	C	2 days	46.00
Strain, lateral ankle; grade 1 fibulotalar strain	QB-LB	1/2 game	.00
Contused sternum	QB-LB	none	.00
Cervical muscle contusion and strain	QB	none	56.00
Traumatic ulnar neuritis	QB	none	156.00
Thigh bruise	QB	none	.00
Cerebral concussion and post concussive headache*	QB	1/2 qtr. game	200.00
Calf bruise and puncture laceration	RB	none	.00
Mild cerebral concussion, headache and dizziness	T	none	.00
Hematoma of dorsal hand	T	none	.00
Mild cerebral concussion	RB	none	35.00
Ankle strain injury	RB	none	239.00
Fracture, 4th metacarpal	E	none	201.00
Grade II strain, fibulotalar ligament*	E	1/2 game	174.00
Grade I medial collateral ligament strain, knee	T	1 game	252.00
Grade I medial collateral ligament strain*	T	none	.00
Strain, 1st MP joint	RB	none	52.00
Calf muscle strain	T	none	.00
Grade I lateral ankle strain*	RB	1/2 game	.00

*Indicates injury occurred on Astroturf during the last game of the season.

According to the National Federation of State High School Associations, 3.5 million boys participated in interscholastic athletics in 1981. Football was the most popular sport, with 958,000 participants. During 1984 in Minnesota there were 20,442 participants (figures not yet available for 1985).[1] Because records of all injuries are not kept, the injury incidence rate and cost are not known. Most reported studies are based on an analysis of emergency room records or computerized data.[2,3] Mueller and Blythe[4] suggest that epidemiologic data on sports injury sites are greatly underreported.

The Consumer Product Safety Commission's national electronic injury surveillance system published data on injuries for the 12-month period ending December 31, 1981. It was estimated that for every 100,000 participants age 5 to 14 there were 358.8 injuries in baseball, 279.7 in basketball, 453.9 in football, 100.9 in gymnastics, 102.3 in wrestling, and 906.7 in bicycling.[4]

The higher rate of injury in the present study is undoubtedly due to the recording of *every* injury, in order to assess the true cost in terms of morbidity and economics.

In this study, 65.6% of injuries occurred in game play. This is similar to the figure of 62.6% reported by Lackland.[2]

Recommendation for or against the use of protective knee braces cannot be made from this study and is beyond the scope of this discussion.

TABLE 2

Summary of injuries by location

Injuries by Region	*Number*	*Percent*
Head and neck	5	15.6%
Ankle	4	12.5
Knee	5	15.6
Hand and wrist	10	31.2
Soft tissue	3	9.3
Shoulder	2	6.2
Elbow	1	3.1
Other	2	6.2
	32	

TABLE 3

Cost of injuries

Total cost	$6,755.00
Average cost per injury	211.09
Average cost per player	187.63
Cost per total player hour	1.40
Cost per game hour	603.12

For a more complete discussion, the reader is referred to one of several studies that evaluates their use at the college level.[5]

The feelings of the players, coaching staff, and physician was that the interaction between shoe and playing surface accounted for the high incidence of game injuries on Astroturf. For a thorough discussion of shoe-surface interface and the complexities of coefficients of friction and hydroplaning effects of cleats, the reader is referred to a symposium on ankle and foot problems in the athlete by Joseph S. Torg.[6] In another study, Culpepper and Niemann at the University of Alabama extensively determined torque values created at the shoe-turf interface and calculated release coefficients of 5 types of football shoes used by university players. They concluded, "None of the shoes tested was superior to any other under all conditions."[7] However, after reviewing their data, Frank G. George, head athletic trainer at Brown University, comments, "As an athletic trainer involved with the prevention of injuries there appears to be a simple answer to this problem. All athletes who play on artificial surfaces should wear non-cleated shoes. A basketball sneaker would perform very well and would certainly reduce the number of injuries caused by the shoe-turf interface."[8]

Conclusions

1. A prospective study of this type, though small in numbers, offers the advantage of longitudinal follow-up and consistency in the management of injuries.

2. Football remains an exciting and popular means of interscholastic competition at all levels. Although injury-mortality rate is acceptably low (.44 per 100,000 participants[3]), morbidity and cost of all injuries is not known.

3. A volunteer physician should be assigned to all high school athletic teams to act as an adviser to players, coaches, and parents and to function as "team physician." This would establish a consistent policy for dealing with all injuries and remove such a burdensome responsibility from the coaching staff. Further, it is proposed that the team physician keep records of injuries sustained.

4. As additional information becomes available on protective knee orthoses and if, as expected, the data supports the use of this device to reduce the frequency and severity of knee injuries, the Minnesota State High School League should be prepared to mandate wear for all high school football players.

5. Enough evidence is available for the Minnesota State High School League to prohibit the use of cleated shoes on artificial turf for high school players.

Acknowledgments

The author acknowledges and appreciates the support and cooperation given by the coaching staff and players of the Zumbrota High School football team to whom the foregoing was extraneous and did not detract from their successful 1985 football season.

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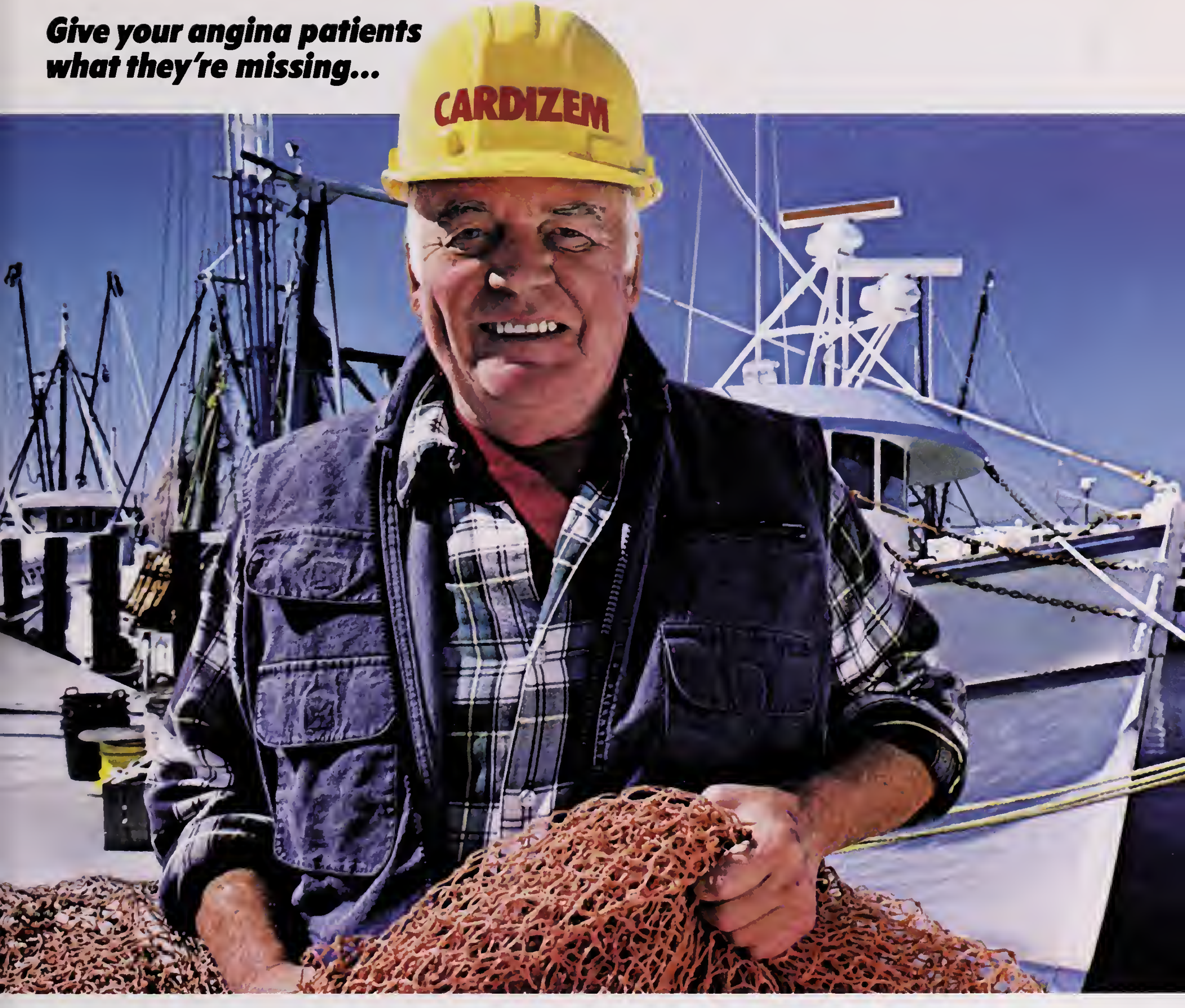

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CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1,243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.
2. **Congestive Heart Failure.** Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt).
   Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited. Caution should be exercised when using the drug in such patients.
3. **Hypotension.** Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.
4. **Acute Hepatic Injury.** In rare instances, significant elevations in enzymes such as alkaline phosphatase, CPK, LDH, SGOT, SGPT, and other symptoms consistent with acute hepatic injury have been noted. These reactions have been reversible upon discontinuation of drug therapy. The relationship to CARDIZEM is uncertain in most cases, but probable in some. (See PRECAUTIONS.)

PRECAUTIONS

General. CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes; however, these changes were reversible with continued dosing.

Drug Interaction. Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS.)

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity. There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.

Pregnancy. Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality. These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.

There are no well-controlled studies in pregnant women; therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. Diltiazem is excreted in human milk. One report suggests that concentrations in breast milk may approximate serum levels. If use of CARDIZEM is deemed essential, an alternative method of infant feeding should be instituted.

Pediatric Use. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy.

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established. The most common occurrences as well as their frequency of presentation are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%). In addition, the following events were reported infrequently (less than 1%):

Cardiovascular:	Angina, arrhythmia, AV block (first degree), AV block (second or third degree — see conduction warning), bradycardia, congestive heart failure, flushing, hypotension, palpitations, syncope
Nervous System:	Amnesia, gait abnormality, hallucinations, insomnia, nervousness, paresthesia, personality change, somnolence, tinnitus, tremor
Gastrointestinal:	Anorexia, constipation, diarrhea, dysgeusia, dyspepsia, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH (see hepatic warnings), vomiting, weight increase
Dermatologic:	Petechiae, pruritus, photosensitivity, urticaria.
Other:	Amblyopia, dyspnea, epistaxis, eye irritation, hyperglycemia, nasal congestion, nocturia, osteoarticular pain, polyuria, sexual difficulties.

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: alopecia, gingival hyperplasia, erythema multiforme, and leukopenia. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established.

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Monitoring Therapeutic Response of Colon Cancer Patients by Immunological Methods

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In a non-randomized study 17 pathologically proven Duke's C patients were monitored by immunological methods before, during, and after treatment. Immunological tests done prior to treatment failed to predict which patients would respond to treatment. However, 11 of 17 patients who consistently maintained a normal lymphocyte mitogenic response to PHA, normal or increased natural killer cell (NK 11+7-) activity, with no detectable T lymphocyte cells with double markers (presence of both helper and suppressor cell markers on single cells) had the best clinical course. Median survival without evidence of active disease for females was 57+ months and 59+ months for males. In contrast, 6 of 17 patients whose immunological tests were consistently abnormal developed progressive disease. Median survival was 38 months for females and 36 months for males.

Immune suppression of cytotoxic drugs has been known since 1921.[1] Studies have demonstrated that cytotoxic drugs at optimal timing and dose can suppress or augment almost any immune response.[2,3]

One effect of cytotoxic drugs is the "immune rebound" effect, first reported in 1967.[4] In cancer patients this effect is usually observed in patients who respond to treatment.[4]

An understanding of this effect has been aided by the availability of monoclonal antibodies to surface markers found on subsets of mononuclear blood cells.[5]

As for the biological reaction involved in the "immune rebound" effect, it has been reported that the inhibition of excessive amounts of prostaglandin production by suppressor monocytes resulted in drug-induced "immune rebound" after cytotoxic drug treatment.[6]

Another study showed that the lymphoproliferative function of interleukin-2 was inhibited by suppressor monocytes.[7] Thus it appears that mononuclear cells play an important role in the "immune rebound" effect.

The following study was done because of our interest in laboratory tests that may be of value in monitoring the immune status of cancer patients while under treatment.

Materials and Methods

Patients

The study population included 17 patients with pathologically proven colon cancer Duke's C who were referred to our outpatient oncology clinic. The group consisted of 9 white males 56 to 75 years of age and 8 females age 49 to 81. Performance status upon entry into the study was ECOG 0 to +1.

Treatment program

Treatment was begun 30 to 60 days after primary surgery for colon cancer. Patients were treated every 28 days with cytotoxic drugs (see below) and an immune modifier (see below) 7 and 14 days prior to drug treatment. This combined treatment program was continued for 6 months. Then patients were treated with immune modifier alone for an additional 6 months at 60-day intervals. Post-treatment patients who continued to show no active disease were monitored clinically and immunologically on a periodic basis for up to 5 years.

Cytotoxic drug program

Five fluorouracil was administered intravenously at 500 mgs/M^2 on days 1 through 4 with intravenous mitomycin C, 15 mgs/M^2, added on day 2.

Immune modifier

Bacillus Calumette Guerin (BCG-Pasteur strain) was administered at a routine dose of 2×10^7 colony forming units per scarification dose. When patient showed an Eastern Cooperative Oncology Group toxicity reaction greater than grade three, the dose was reduced until toxicity was no greater than grade two.

Informed consent

A form approved by the Metropolitan Medical Center (MMC) institutional review board was

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signed by the patient prior to treatment.

In vitro peripheral blood tests

All patients were tested prior to treatment and then at 90-day intervals during treatment and at 180-day intervals post-treatment up to 5 years. Surface marker tests by immunofluorescent methods[8] were used to determine relative percent and absolute number (with CBC), of B and T lymphocytes, the relative ratio of helper and suppressor T lymphocytes, and presence of these cells with both helper and suppressor markers and natural killer cell (NK 11+7-) activity. Reagents for these tests were obtained from Becton-Dickinson, California. Mitogenic activation of lymphocytes by phytohemagglutinin (PHA) was by a tritiated leucine uptake method.[9] Reagents for this test were obtained from New England Nuclear, Massachusetts, and Welcome Diagnostics, New York.

In vivo tests

In vivo tests included delayed tissue hypersensitivity to 5 tuberculin units of purified protein derivative (PPD, Squibb) and dinitrochlorobenzene (DNCB, Eastman, New York) at a sensitizing dose of 2 mgs and challenge doses of 0.025 mg, 0.05 mg, and 0.1 mg.

Other laboratory tests

Additional laboratory tests were conducted as clinically indicated.

Immune Supression

For the purposes of this study, we defined immunosuppression as a state where the in vitro mitogenic response of lymphocytes was consistently below our laboratory reference value.

Results

Table 1 shows the relationship between immunological tests done and patient response to treatment. Because 15 of 17 cases had evidence of pretreatment immune suppression, tests used were of no value in predicting which patients would respond to treatment. These pre-treatment tests results were of value in establishing baseline data on our patients.

Our data demonstrated that absolute numbers of B and T lymphocytes, total lymphocytes, and PPD and DNCB tissue hypersensitivity tests did not correlate with treatment response.

In contrast, a normal mitogenic response to PHA by lymphocytes, a normal ratio of helper to suppressor T lymphocytes with an absence of cells with double markers, and an increase in NK 11+7- cell activity appeared to relate to a favorable clinical response.

TABLE 1

Correlation between immunological tests and clinical status of Duke's C patients responsive and non-responsive to treatment

Test	*Responsive to Treatment % Correlation*	*Non-Responsive to Treatment % Correlation*
Absolute #:		
1. B, T lymphocytes	18 (2/11)	33 (2/6)
2. Total T lymphocytes	27 (3/11)	33 (2/6)
Helper/suppressor ratio*	73 (8/11)	66 (4/6)
Mitogenic response to PHA	82 (9/11)	83 (5/6)
PPD skin test	27 (3/11)	17 (1/6)
DNCB skin test	36 (4/11)	33 (2/6)
NK cell activity**	73 (8/11)	83 (5/6)

*When cells with double markers were present

**NK activity of cells with NK 11+7- markers

Patients who had abnormal results to the above tests showed a poor clinical response to treatment.

Table 2 compares the immune and clinical status of patients before, during, and after treatment. Our data indicated that those patients who maintained or had their immune functions restored, as evidenced by our tests, had the best survival time.

Median survival for our 11 treatment responders was 59+ months with a range of 53 to 69 months. The 6 non-responders had a median survival of 37 months with a range of 24 to 48 months.

In this study there was no sex difference in survival for the treatment responders and non-responders.

Although this was not a randomized study, we did compare our tumor registry historic data on Duke's C patients of the same sex and age range who were diagnosed in 1980 and treated by surgery and cytotoxic drugs alone. No attempt was made to match the surgical procedure or cytotoxic drug treatment.

Females in this control group had a median survival of 37 months and males 26 months. Five females and one male in the control group are still alive (median survival of 52+ months). Nine of the 11 control patients who died had a cancer-related death.

Discussion

Our study showed that pre-treatment immunological tests were of no value in predicting which patients would respond to treatment.

TABLE 2

Comparison between immunological tests and clinical state before, during, and after treatment of Duke's colon cancer patients

	Immune Tests			*Clinical Status*			
Patients	*Before Rx*	*During Rx*	*After** Rx*	*Before Rx*	*During Rx*	*After Rx*	*Median Survival (Months)*
Females	7-IS***	5-NIS	6-NIS	8-NAD+	6-NAD	6-NAD	57+
	1-NIS#	3-IS	2-IS		2-AD++	2-AD	38
Males	8-IS	4-NIS	5-NIS	9-NAD	9-NAD	5-NAD	59+
	1-NIS	5-IS	4-IS			4-AD	36

*During Rx
**Active one year Rx and at last follow up
+NAD No active disease
***IS Immune suppression
#NIS No immune suppression
++AD Active disease

However, when the helper and suppressor lymphocytes showed no double markers, the natural killer cell and mitogenic activity were normal during the course of treatment. Such results appeared related to a favorable clinical response to treatment.

It has been reported that T lymphocyte helper/suppressor ratios are of no value in monitoring cancer treatment.[10] In our study, such ratios alone were of no value. However, even in the presence of a normal ratio, when individual T lymphocytes consistently contained both helper and suppressor markers (double markers), treatment failure was observed.

Of the 6 non-responders to treatment, 4 consistently demonstrated cells with double markers. In all of these cases cells with double markers were identified 3 to 6 months prior to confirmation of progressive disease. Additional studies are needed to confirm this observation.

It has been reported that laboratory tests for natural killer cells are of no value in determining response to treatment of cancer.[11] In one study, colon cancer patients with presurgery natural killer cell suppression showed an increase in activity 1 to 3 months following surgery.[12] This study did not report on the clinical significance of the latter observation.

Our study also showed no correlation between total natural killer cell activity and treatment response. However, when the natural killer cell subset, NK 11+7-, cytotoxic activity was studied, a relationship between increased NK 11+7- activity and clinical response was observed.

This population of NK cells has been reported to have a high in vitro cytotoxic index for cancer cells.[13]

Whether the above observation will have clinical value remains to be determined.

Summary

In summary, 17 colon cancer Duke's C patients were studied by immunological tests before, during, and after treatment. Our results indicated that some of the tests used may be of value in monitoring the course of colon cancer treatment.

Acknowledgments

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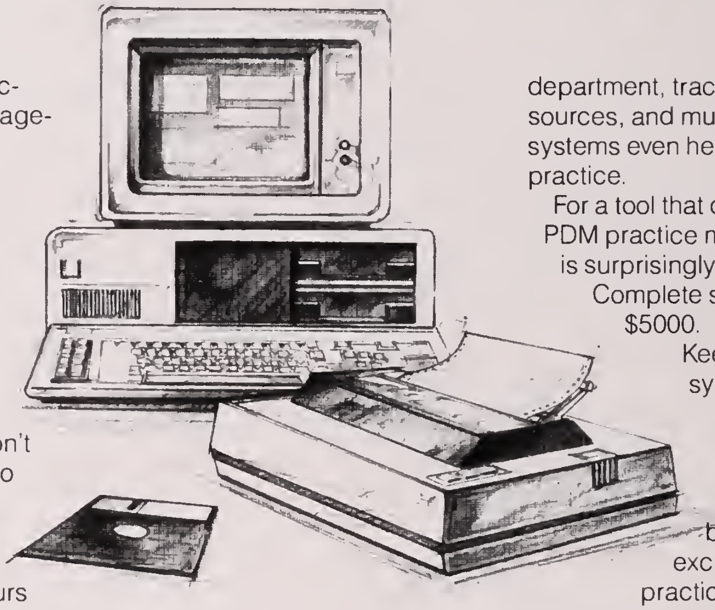

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Single-Dose Therapy in Childhood Urinary Tract Infections

MARK A. NAMMACHER, M.D., M.P.H.*, FREDERICK A. MC CURDY, M.D., PH.D.†, RENNER ANDERSON, M.D.*, ROBERT L. VERNIER, M.D.

Urinary tract infection (UTI) in children is a very common problem and a cause of considerable morbidity, cost, and, with recurrent pyelonephritis, may result in loss of renal function. Although bacterial UTIs are characterized as cystitis or pyelonephritis on the basis of urine culture results and clinical signs and symptoms, it is apparent that such a classification is incomplete, particularly with regard to the appropriate therapy for an individual patient. Because it seems clear that infections at different sites in the urinary tract have very different pathological characteristics and consequences for the child and require different therapy, the level of the infection, cystitis vs. pyelonephritis, becomes an important clinical consideration. Bladder infections are presumably superficial and involve a mucosal site to which high concentrations of antibiotics can be easily delivered. In contrast, pyelonephritis is a deep parenchymal infection, usually associated with obstruction and/or vesicoureteral reflux in children, to whom delivery of antibiotics in high concentration over long periods of time may be required to eradicate the infection.

Unfortunately, there are no reliable tests or techniques that identify the patient with upper tract UTI in children,[1,2] and the symptomotology and signs of UTI are particularly unreliable guides to the level of diagnosis in infants and young children. Consequently, virtually all UTIs have traditionally been treated similarly with 10-14 days of antimicrobial agents.

Recent experience in adult women indicates that a single dose of antibiotics is effective in treating lower urinary tract infections.[3,8] Single-dose therapy (SD) in this population has been shown to have many advantages, including improved patient compliance, reduced costs, and lowered incidence of side effects.[6,7] The use of SD therapy also has the potential for allowing recognition of those patients with upper tract infection who need further investigation and longer term therapy.[3,4] It has been shown that the majority of adult patients with cystitis are cured with SD therapy, whereas early recurrence of bacteruria after SD therapy is highly indicative of upper tract (pyelonephritic) infection.

With these advantages in mind, we undertook a controlled comparative trial of SD and conventional (CD) therapy in children with UTI.

Patients and Methods

Ambulatory children 2 through 15 years of age who were enrolled in Group Health, Inc. and who met the following conditions entered the multiclinic study: 60-day interval since any previous UTI, 14 days off any antibiotics, negative allergy history to the antibiotics used, two clean-catch or bagged urine cultures of $\geq 10^5$ colonies/cc of the same strain of organism, completed informed consent. (This study was approved by Group Health, Inc. and by the Committee for Use of Human Subjects in Research, University of Minnesota.) Hospitalized children were excluded. Accepted patients were randomly assigned by single-blind method to either a SD or CD course of treatment. They were further randomized within each of these groups to Amoxicillin (60 mg/kg as a single dose, and 40 mg/kg/day × 10 days = CD) or Sulfisoxazole (100 mg/kg as a single dose, and 150 mg/kg/day × 10 days = CD) subgroups. Each individual was followed by Uricult® urine cultures on the third day following cessation of treatment and then weekly thereafter to 60 days post-treatment. Standard inoculated urine cultures were done on day 7 and to confirm all positive Uricult® results. A treatment failure was defined as a urine culture with $\geq 10^5$ colonies/cc of a pathogenic organism. The term recurrence was used to describe the subsequent appearance of a positive urine culture in the treated children. Differentiation between relapse with the same strain of organism vs. reinfection with a different strain was not attempted because the technique for typing of isolated strains was not available.

Information was obtained on previous UTIs and instrumentation of the urinary tract including cystoscopy and surgery, on the presence or absence of pyuria (>5 WBC/HPF) and on the clinical judgment for the presence of pyelonephritis. The in vitro sensitivity of the organisms (disc method) to

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TABLE

Demographic, clinical, and laboratory studies of the study population

	Single Dose	*10-Day Dose*
Total	32	36
Sex: Male: Female	2:30	2:34
Age: Mean	7 years	7 years
Median	7 years	6 years
Initial Organisms: E. Coli	29	32
Citrobacter	1	
Staphlococci	1	1
Proteus	1	1
Klebsiella	2	
In vitro antibiotic resistance: Total evaluated	1:23	4:19
Number with previous UTIs	12	10
Number of above who recurred	6	7
Prior instrumentation (cysto, surgery)	4	3
Number who completed IVU and or VCUG	20	18
Number with abnormal X-rays	5	5
Abnormal X-rays with early recurrence	2	2
Presented with pyuria (%)	75	81
Clinical diagnosis pyelonephritis	2	3
Number on Amoxicillin	18	23
Early recurrence*	9	4
Number on Sulfasoxazole	14	13
Early recurrence*	5	3

*Early recurrence = positive culture >105 colonies ml on or before 14 days of treatment.

the antibiotics used was recorded. Although intravenous urography (IVU) and voiding cystourethrograms (VCUG) were not protocol requirements, many children had these performed, and the results were noted (Table).

Results

Sixty-eight children were entered into the study. The table shows comparative factors between the SD and CD groups. There were no significant differences between the groups with regard to age, sex, type of organism, antibiotic resistance, prevalence of previous UTIs, instrumentation, abnormal radiologic studies, presentation with pyuria, or the clinical diagnosis of pyelonephritis (Table).

Early treatment failure was defined as a positive culture within the first 14 days following cessation of therapy. Fourteen of 32 (44%) in the SD group and 7 of 36 (19%) of the CD group developed early recurrence ($p < .01$), suggesting the inferiority of SD antibiotic treatment over the short term. Long-term treatment successes were appropriately observed with life table analyses where patients were leaving the study over time, such as for recurrences in this population (Figure). The probability of recurrence at the completion of our study was 50% of the SD group and 39% of the CD ($p > .05$). The rapid decline of successes within the first two weeks for patients with SD treatment stabilized over time while patients receiving CD therapy continued to show a persistent decline in sterile urinalysis until the two success rates began to approach one another over the 60-day duration of follow-up.

The study also revealed significant differences in the two antibiotic regimens. Among patients receiving Amoxicillin, there was a higher number of early treatment failures in the SD group than in the CD group ($p < .05$). Those on Sulfasoxazole did not experience this difference between the SD and CD groups.

Discussion

The observed high incidence (44%) of early recurrence of UTI in children receiving single-dose therapy with two different drugs as compared to the incidence of recurrence (19%) following conventional therapy in divided doses for 10 days using the same drugs suggests that single-dose therapy is not a useful approach to the management of UTI in children. Previous evaluations of single-dose therapy in children have indicated both acceptable "cure" rates[9,11] and unacceptable incidences of recurrent UTIs.[12,13] In two small uncontrolled studies of single-dose Amoxicillin therapy in patients considered to have lower tract infections based on clinical

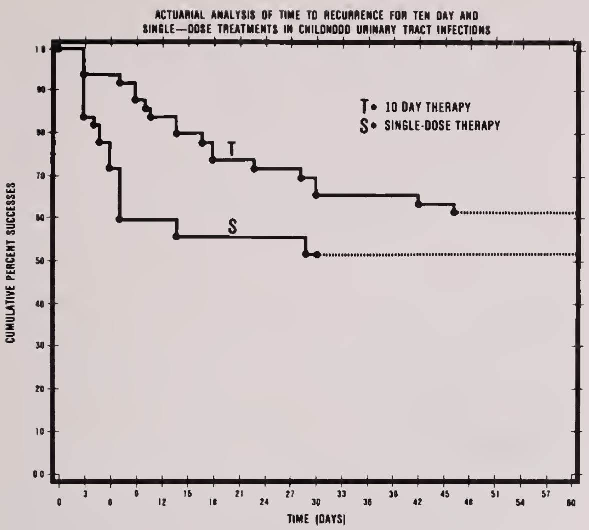

Figure - Actuarial analysis of time to recurrence for 10-day and single dose treatments in childhood urinary tract infections—cumulative percent success.

symptoms, cure rates of 75%[14] and 77%[15] have been reported. These cure rates compare favorably with the general experience as did the rate of infection at three months after infection.[15] In other controlled studies of pediatric patients, short-term cure rates of 70% using a single dose of Trimethoprim-sulfamethoxazole[9] and 93% using a single dose of Sulfafurazole have been described.[10] In contrast, a recent controlled trial of a two-dose single-day treatment course with Cefadroxil was shown to be less effective than conventional treatment.[12] In another controlled trial using single-dose Amoxicillin in pediatric patients, the short-term cure rate was 63% with SD as compared to 92% in patients given conventional therapy.[13] Thus, the results obtained in the present controlled comparative trial of SD vs. CD treatment in ambulatory children appear to support the majority view that SD therapy cannot be recommended for treatment of UTI in children at this time. The relatively high frequency of recurrent infection in both treatment groups may reflect the fact that 22 of the 68 children in this study were shown to have had previous UTIs. It has been shown that children with prior UTI have a high frequency of recurrence within the three months following conventional therapy.[16]

Alternative approaches to conventional 10-14 day therapy are, however, needed. Attempts to treat children with UTI for two and three days with Nitrofurantoin[17] and with various drugs in divided doses[18] have been reported as comparable to the results for treatment for 10 days.

The choice of antibiotics for further trials has also been clarified to some extent by the present study. The higher incidence of recurrence by 14 days in the Amoxicillin-treated group may reflect the fact that single doses of this drug have been shown to be excreted within 6-8 hours, whereas sulfonamides persist in the urine for over 14 hours following a single dose.[19] A recent comparative study of single-dose therapy for cystitis for women, using Trimethaprim-sulfamethoxazole, Amoxicillin, and Cyclacillin by Hooten et al.[8] appeared to confirm this concept and showed that Trimethoprim-sulfamethoxazole was superior to either of the other two drugs, which were more rapidly excreted. The later study also emphasized one of the potential risks of single-dose therapy: one patient treated with single-dose Cyclacillin developed clinical pyelonephritis with a positive culture for the original organism on the third day after SD therapy. Three other patients had positive cultures and laboratory evidence for progression to upper tract infection after single-dose therapy and were successfully treated with conventional therapy.

Because of the high incidence of recurrence and/or relapse of infection in most controlled trials of SD therapy for UTI in children, as confirmed in the present study, no evidence has been obtained in support of the hypothetical value of response to SD therapy in allowing recognition of upper tract involvement in clinically uncomplicated UTI. Although this study was not designed to evaluate the level of infection in the children, and radiologic studies were not regularly obtained, it is of interest that abnormal radiologic studies were equally common in the SD and CD therapy groups. These results are similar to those reported by Avner et al.,[13] who concluded that the response to single-dose Amoxicillin therapy does not discriminate uncomplicated urinary tract infection in children from UTI with structural abnormalities of the urinary tract. We concur with their recommendation that all children less than 5 years of age, after their first well documented UTI, should undergo appropriate radiologic evaluation.

Acknowledgments

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Pyloric Stenosis Associated With Erythromycin Ingested Through Breastmilk

HOWARD STANG, M.D.*

The etiology of pyloric stenosis remains unclear. A case report is presented of a 3-week-old breastfed infant who developed pyloric stenosis shortly after her mother was treated with erythromycin for mastitis. A retrospective chart review of 122 cases of pyloric stenosis at a children's referral hospital uncovered a total of 6 (5%) infants treated with erythromycin. Caution should be used when prescribing erythromycin to infants less than 3 months old and to breastfeeding mothers.

The etiology of pyloric stenosis (PS) remains unclear despite a wealth of literature citing several associations.[1-13]

Implicated as causative factors in PS are several medications that may reach the infant transplacentally or postnatally through the oral route.

In the *Journal of Pediatric Surgery* in 1976, Dr. J. A. SanFillipo reported during one year six cases of PS, five of whom had been given erythromycin estolate prior to developing symptoms.[8]

This report implicates erythromycin excreted through the breastmilk and ingested by an infant who concomitantly developed classical hypertrophic PS.

Case Report

AR was the 2980 gram 38-week-old female child of a 29-year-old primigravida. The pregnancy was uncomplicated except for the mother's 50 lb. weight gain, and no unusual prenatal medications were administered. AR was delivered from a vertex presentation with a prolonged second stage with resultant Apgars of 3, 5, and 6 at 1, 5, and 10 minutes, respectively.

At 24 hours tonic-clonic seizures began, and AR was transferred to the University of Minnesota, where her seizures were thought to be due to perinatal asphyxia and were controlled with phenobarbital. She was discharged at one week of age on breastfeeding and phenobarbital.

When AR was 3 weeks old, her mother developed mastitis, and because of a penicillin allergy, was treated with erythromycin base (Erytab-Abbott) 250 mg p.o. tid. When the mother started this medication, AR's stools turned an orange-red color and were guiac negative. Five days into the course of erythromycin, AR began to be more irritable and started to have persistent nonprojectile vomiting. It was felt at that time that erythromycin was crossing into the breastmilk, causing gastritis and discoloring the stools with the dye from these pink tablets. Even after the erythromycin was discontinued, AR's vomiting persisted and her weight began to decline. An upper gastrointestinal study demonstrated classical hypertrophic PS, and AR underwent a Ramstedt pyloromyotomy with excellent results. Reinstitution of breastfeeding went smoothly with excellent weight gain.

To date, she has tolerated several antibiotics for otitis media and developmentally is doing well, having been off of phenobarbital since four months of age. There was no family history of PS.

Methods and Results

A retrospective chart review was done of all cases of hypertrophic pyloric stenosis (PS) who underwent pyloromyotomy at St. Paul Children's Hospital between January 1979 and December 1983. St. Paul Children's is one of two children's hospitals in the Twin Cities that provides primary, secondary, and tertiary care.

There were a total of 122 patients, 100 (82%) male and 22 (18%) female. The average age at the time of operation was 38.4 days. Breastfed infants made up 48% and formula fed infants 52% of the study group.

Sixteen percent of the infants were delivered by caesarean section; 15.5% of the 122 had a positive family history of PS in a first-degree relative.

Thirty (24.6%) of the 121 mothers reported taking at least one medication during the pregnancy besides prenatal vitamins, iron, or calcium supplements. Seven took antibiotics, five antihistamines, and three Bendectin (Table 1).

Fifteen of the infants' parents gave a history of the infant being treated with medications (besides iron or fluoride) concurrently with the onset of the vomiting symptoms that led to the diagnosis of pyloric stenosis. Six infants (5%) were treated with erythromycin for diagnoses of impetigo, positive Staphylococcus culture from nares, periorbital cel-

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*Department of Pediatrics, Group Health Inc., White Bear Lake, Minnesota. Reprints: Howard Stang, M.D., 1430 Highway 96, White Bear Lake, Minnesota 55110.

TABLE 1
Maternal medication history during pregnancy (n = 121)

Ampicillin-penicillin	7
Antihistamines	5
Bendectin	3
Anticonvulsants	2
Thyroid medications	2
Diuretics	2
Erythromycin	1
Miscellaneous	8

TABLE 2
Infant medication history (n = 122)

Erythromycin	6
Amoxicillin-penicillin	3
Dicloxacillin	3
Nystatin	2
Antihistamines	3
Iron	1
Phenobarbital	1

lulitis, presumed chlamydia pneumonia with conjuctivitis, otitis media, and maternal treatment of mastitis (case report) (Table 2). No other breastfeeding mothers (n59) reported being on medications when the diagnosis of PS was made (aside from the index case).

There were a total of 18 medications given to the 15 infants (Table 2). Erythromycin was the most commonly used.

Discussion

In this retrospective chart review, information was obtained from nursing and physician histories. Unless one inquires specifically, actual drug ingestion histories may be underreported by parents and hospital staff because of the relatively unknown associations between drugs and PS. None of the other medications reported in this study has previously been implicated with PS except Bendectin taken prenatally[9] and erythromycin estolate taken postnatally.[8]

Bendectin use was reported by 2.4% of the mothers in this study. Eskenazi and Bracken in 1982 reported a fourfold increase in PS among infants born to mothers who had used Bendectin and no other drugs during pregnancy.[9] Subsequently in 1983, Mitchell et al. in a large case-control study suggested that Bendectin does not increase the risk of PS.[10] Seventeen percent of the 325 infants with PS in Mitchell's report were exposed to Bendectin.

The only other report in the literature citing an association between drugs and PS was by Dr. SanFillipo in 1976 in which he reported five infants who ingested erythromycin estolate for therapy of superficial skin infections and subsequently developed PS.[8] After discontinuation of the use of erythromycin in infants, the incidence fell back to normal from the fourfold increase reported during the use of erythromycin. Erythromycin estolate was rarely used in the 1980s because of the reported liver toxicity.[14] The patients in this report received either erythromycin base or the ethyl succinate rather than the estolate conjugate.

The index case raises one's suspicion that the erythromycin crossed over into the breastmilk in sufficient quantities to cause the common side effects of gastric irritation.[14,15] The pinkish-orange stool was probably malabsorbed dye from the pink Erytab that the mother was taking. Was there enough pyloro-gastric irritation to induce pyloric muscle hypertrophy? SanFillipo surmised the pathophysiology of erythromycin-induced PS to be "initial pylorospasm precipitated by the drug and progression to pyloric hypertrophy."[8]

Could the phenobarbital and perinatal asphyxia be associated with PS? Only one other study subject had a significant history of asphyxia but was at 28 weeks gestation and was not treated with anticonvulsants.

There must be other biochemical pathways that lead to the pyloric hypertrophy. Researchers have questioned the role of pentagastrin and gastrin in the pathophysiology. Dodge et al. reproduced pyloric hypertrophy in the offspring of pregnant dogs by injecting the bitches with depot forms of pentagastrin.[11] Several articles subsequently dismissed the association between high maternal or infant levels of gastrin and PS.[12,13] A literature search failed to uncover an association between erythromycin and increased gastrin levels, therefore the gastrointestinal side effects must be purely from the mucosal irritation.

Therefore, the present report represents a possible etiological association between erythromycin and PS, and particularly the acquisition of erythromycin side effects by ingestion through breastfeeding.

Subsequent prospective studies should be undertaken following cohorts of infants treated with various medications to observe the actual risk of developing PS. Until these studies are completed, erythromycin should be used cautiously in the first three months of life, and parents should be educated in the symptoms of PS if erythromycin is given. The same applies to breastfeeding mothers who are given erythromycin. When obtaining histories for infants vomiting from breastfeeding mothers, one should always inquire into maternal drug ingestion.

References to page 682.

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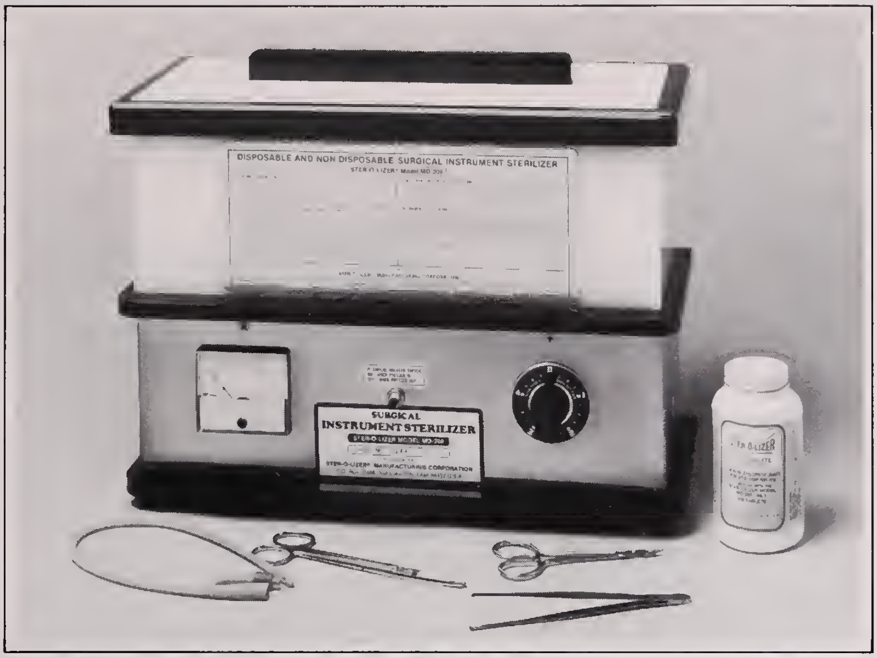

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Rheumatology Corner

Reiter's Syndrome and Reactive Arthritis

PETER A. SCHLESINGER, M.D.*

Historically, a relationship between arthritis and antecedent venereal or enteric infection was noted as early as the 18th century. However, only with the advent of modern laboratory techniques could these arthritides be distinguished from entities such as rheumatoid arthritis, gout, and disseminated gonococcal infection (DGI). We now recognize the concept of "reactive arthritis," which denotes a *sterile* synovitis occurring in association with an infection elsewhere in the body.[1,2] Reiter's syndrome, consisting of the triad of arthritis, conjunctivitis, and urethritis or cervicitis, is actually a subset of reactive arthritis. Eradication of the associated infection does not (unlike DGI) shorten the course of the arthritis. Furthermore, patients with these reactive arthritides have an increased likelihood of carrying the tissue antigen HLA-B27. These facts suggest that the patient's immune response to the triggering infection is responsible for the arthritis.

In terms of specific initiating infections, *Chlamydia trachomatis* has been strongly implicated for sexually acquired reactive arthritis.[1-3] In such patients, a history of a new sexual partner, and/or the presence of *C. trachomatis* in the genital tract is frequently linked with disease onset. For enteric reactive arthritis, implicated organisms include certain salmonella and shigella strains, *Yersinia enterocolitica*, *Campylobacter jejuni*, and possibly *Clostridium difficile*.[1,2,4]

The joint manifestations of these reactive arthritides are remarkably consistent from patient to patient. They are typically nonmigratory, oligoarticular, asymmetric, and lower extremity predominant.[1,2,5] There is a strong predilection for inflammation at tendinous insertions (entheses), particularly the Achilles tendon. Also characteristic is dactylitis, or periostitis along the shafts of the phalanges, giving rise to a "sausage" finger or toe. Sacroiliitis and spondylitis may occur as well.

Extraarticular involvement is common.[1,2,5] Urethritis, from clinically severe to asymptomatic, is frequent. It is seen in enteric reactive arthritis as well and can occur in the absence of a definable urethral infection. Conjunctivitis and oral ulcers are usually asymptomatic. The skin lesions of keratodermia blennorrhagica begin as vesicles and then develop hyperkeratotic crusts; they most frequently involve the palms, soles, and glans penis (balanitis). Iritis, aortitis, or carditis are rarely seen. If the triggering infection is enteric, a history of recent or ongoing diarrhea is usually elicited.

The diagnosis of Reiter's syndrome and reactive arthritis is clinical; an associated infection is often but not always identifiable. An asymmetric, lower extremity predominant arthritis in a young, sexually active individual is quite likely to be a reactive arthritis, whether or not extraarticular symptoms are present. Arthrocentesis and synovial fluid analysis will be helpful in excluding septic arthritis and gout. If such an individual has no history of diarrheal illness, I favor obtaining a urethral or cervical smear for the presence of *C. trachomatis* antigens, since their detection has been greatly facilitated by the development of sensitive and specific commercial procedures (Microtrak^R, Syva; Chlamydiazyme^R, Abbott Laboratories).[6] In the setting of a post-diarrheal arthritis, isolation of an appropriate pathogen from the stool is supportive of the diagnosis. Tests for rheumatoid factor are non-reactive, and other routine laboratory tests are non-specific. HLA-B27 testing is only an adjunct in patients suspected of having Reiter's syndrome; it cannot absolutely confirm or exclude the diagnosis, since some Reiter's patients are B27-negative, and most B27-positive persons do not have arthritis.[7] The differential diagnosis includes other causes of an oligoarthritis, such as rheumatic fever and Lyme disease; patients may have a dual infection with *N. gonorrhoeae* and *C. trachomatis*.

The cornerstone of medical therapy in these patients is nonsteroidal anti-inflammatory drugs (NSAIDs), such as indomethacin, sulindac, or naproxen. Relatively high doses, such as indomethacin 150-200 mg/day, are often required for relief. Salicylates are often ineffective, unlike the situation in rheumatoid arthritis or rheumatic fever. Intraarticular injections of a corticosteroid preparation may be necessary if a particular joint is refractory to NSAID therapy. The arthritis usually remits after several weeks to months but may become chronic. In the rare patient who manifests a progressive course with joint destruction, immunosuppressive agents are sometimes used. Antibiotic therapy for chlamydial urethritis or cervicitis, usually with a tetracycline, is given to the patient and sexual partner, not to shorten the course of the arthritis, but to eradicate the carrier state and to prevent genital tract sequelae, especially in females.[8] Generally, antibiotic therapy is not required in enteric reactive arthritis (other than *C. difficile*), since the infection is usually self-limiting.

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General Surgery

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Allegation

Failure to diagnose and treat anal cancer.

Facts

The patient, a 53-year-old married female, presented to Dr. X, her family physician, on March 17, 1981, because of an anal growth she noted to have been present for approximately one month. Dr. X diagnosed the mass as a thrombosed internal hemorrhoid and instructed the patient to return in one month. The patient next returned on July 22, 1982. Examination revealed the previously suspected internal hemorrhoid had increased in size, and it was described as being fairly firm, much like a rectal mass. The patient was referred to Dr. Y for surgical consultation to rule out cancer.

The patient presented to Dr. Y on July 27, 1982. A digital rectal exam and a visual exam with an anascope revealed a linear shaped growth approximately one inch long by one-half inch wide extending in continuity to a point just above the dentate line. The growth was covered with normal, smooth tissue and was felt to represent an old thrombotic fibrosed mixed hemorrhoid. Although Dr. Y testified in his deposition that he suggested the patient undergo a biopsy of the mass, the patient denied this. The only documentation of the supposed conversation was noted in Dr. Y's letter to Dr. X wherein he stated, "since the fibrotic hemorrhoid is apparently causing no discomfort, she (the patient) was rather reluctant to consider having it removed."

On July 30, 1982, the patient returned to Dr. X, and was reassured and advised to return on a PRN basis. On July 19, 1983, the patient presented to another physician because of a lump in the right groin. He recommended the lump be biopsied, and the patient was referred to a large medical facility where a diagnosis of a Grade IV squamous cell carcinoma of the anus with regional metastasis was made. At the time a lawsuit was filed, the patient's prognosis was guarded.

Disposition

After negotiations with the claimant's attorney, this case was settled for $65,000 on behalf of Dr. Y.

Reasons for Settlement

The plaintiff's experts were prepared to testify that:

1) Dr. Y should have followed the patient at regular intervals to monitor the size and appearance of the tumor.

2) In all probability, the primary tumor had not metastasized to the lymph nodes when Dr. Y saw the patient in July 1982.

3) The delay in diagnosis and treatment significantly compromised the patient's chance of survival.

4) The records do not support Dr. Y's testimony that he recommended the mass be biopsied and the patient refused.

Defense experts felt that Dr. Y's decision not to more aggressively recommend a biopsy could arguably be supported as a reasonable judgment decision based on his stated findings. However, the insufficient documentation regarding the discussion with the patient and the failure to recommend appropriate follow-up made this case difficult to defend.

Risk Management Comments

The notation in Dr. Y's letter about the patient's reluctance to have the "hemorrhoid" removed would have been of some help in defending this case. However, specific documentation of what the patient was told regarding the need for a biopsy for definitive diagnosis and her refusal to have a biopsy should have appeared in Dr. Y's record of the examination itself. Minnesota law of informed consent requires that the patient be advised of the risks, benefits, and alternatives to treatment. The risks of *not* undergoing a recommended procedure should also be discussed. Whenever a patient refuses recommended treatment, it is critical that the information provided the patient and the patient's refusal be clearly documented in the record.

Frequently, failure to diagnose cancer cases center not on the initial examination of the patient, but on allegations of failure to recommend appropriate follow-up examinations or treatment. Whenever a diagnosis of cancer is entertained, particularly when the patient is being seen in consultation to rule out cancer, the physician should clearly document the findings on examination, clinical assessment, recommended treatment plan, and specific instructions given to the patient regarding the need for follow-up.

Complete and accurate communication between referring physicians and consultants is essential to prevent patient injuries. The referring physician should provide the consultant with full information about the patient's history, clinical findings, and reasons for the referral. The consultant must provide the referring physician with complete information about the patient's examination, diagnosis, recommended treatment plan, and instructions regarding the need for follow-up. In this case, Dr. Y should have informed Dr. X specifically about the recommended biopsy and the patient's refusal so that Dr. X would have been aware of the need to monitor the patient closely on an ongoing basis. It must also be clearly delineated whether the referring physician or the consultant will be responsible for providing follow-up care.

CONTINUING MEDICAL EDUCATION
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Fall-Spring Conference Schedule

Mark your calendar now for these upcoming conferences:

1986	
November 8	Neurology Update, St. Paul, MN
December 4-6	Cardiopulmonary Medicine, St. Paul, MN
1987	
January 30	Detection and Diagnosis of Substance Use Disorders, St. Paul, MN
February 6	Burn Care Update, St. Paul, MN
March 4-7	Fifth Annual Critical Care Conference, St. Paul, MN
March 20-21	Eighth Annual Occupational Medicine Update, St. Paul, MN
April 2-4	Strategies in Primary Care Medicine, St. Paul, MN
April 9-10	Obstetrics & Gynecology Update, St. Paul, MN

Information and registration: Continuing Medical Education, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; Phone 612/221-3992.

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Now the evidence looks better than ever

Significantly reduced risk of endometrial hyperplasia

Endometrial hyperplasia was significantly reduced when progestin was added to PREMARIN therapy for more than ten days a month.[1-4] The risk of endometrial hyperplasia may also be reduced through cyclic administration of unopposed, low-dose PREMARIN.

Effect on lipids—an important feature

PREMARIN used alone does not adversely affect lipid levels. In fact, a clinical study has shown a significant increase in HDL cholesterol—from 49.7 mg/dL to 56.4 mg/dL—and decrease in LDL cholesterol—from 165.1 mg/dL to 138.1 mg/dL—after one year of therapy with PREMARIN, 0.625 mg.[5]

Low-dose control of menopausal symptoms*

PREMARIN effectively relieves vasomotor symptoms, such as hot flashes. When estrogen deficiency is limited to atrophic vaginitis, PREMARIN® (conjugated estrogens) Vaginal Cream restores the vaginal environment to its premenopausal state.

The most widely used, most extensively studied estrogen worldwide.

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(Conjugated Estrogens Tablets)

Most trusted for more reasons

*PREMARIN is indicated for moderate-to-severe vasomotor symptoms.

Please see following page for brief summary of prescribing information.

For moderate-to-severe vasomotor symptoms

PREMARIN®

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0.3 mg
0.625 mg
0.9 mg
1.25 mg
2.5 mg

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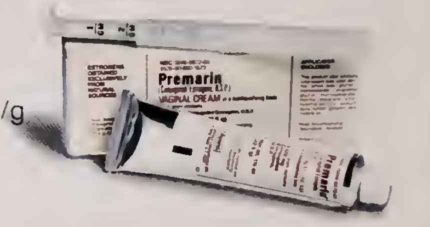
For atrophic vaginitis

PREMARIN®

(Conjugated Estrogens)

Vaginal Cream

0.625mg/g



BRIEF SUMMARY *(FOR FULL PRESCRIBING INFORMATION AND PATIENT INFORMATION. SEE PACKAGE CIRCULARS.)*

PREMARIN® Brand of conjugated estrogens tablets, USP
PREMARIN® Brand of conjugated estrogens Vaginal Cream in a nonliquefying base

1 ESTROGENS HAVE BEEN REPORTED TO INCREASE THE RISK OF ENDOMETRIAL CARCINOMA

Three independent case control studies have reported an increased risk of endometrial cancer in postmenopausal women exposed to exogenous estrogens for more than one year. This risk was independent of the other known risk factors for endometrial cancer These studies are further supported by the finding that incidence rates of endometrial cancer have increased sharply since 1969 in eight different areas of the United States with population-based cancer reporting systems, an increase which may be related to the rapidly expanding use of estrogens during the last decade The three case control studies reported that the risk of endometrial cancer in estrogen users was about 4 5 to 13 9 times greater than in nonusers The risk appears to depend on both duration of treatment and on estrogen dose In view of these findings, when estrogens are used for the treatment of menopausal symptoms, the lowest dose that will control symptoms should be utilized and medication should be discontinued as soon as possible When prolonged treatment is medically indicated, the patient should be reassessed on at least a semiannual basis to determine the need for continued therapy Although the evidence must be considered preliminary, one study suggests that cyclic administration of low doses of estrogen may carry less risk than continuous administration, it therefore appears prudent to utilize such a regimen. Close clinical surveillance of all women taking estrogens is important. In all cases of undiagnosed persistent or recurring abnormal vaginal bleeding, adequate diagnostic measures should be undertaken to rule out malignancy There is no evidence at present that "natural" estrogens are more or less hazardous than "synthetic" estrogens at equiestrogenic doses

2. ESTROGENS SHOULD NOT BE USED DURING PREGNANCY

The use of female sex hormones, both estrogens and progestogens, during early pregnancy may seriously damage the offspring It has been shown that females exposed in utero to diethylstilbestrol, a non-steroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare This risk has been estimated as not greater than 4 per 1,000 exposures. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have vaginal adenosis, epithelial changes of the vagina and cervix Although these changes are histologically benign, it is not known whether they are precursors of malignancy Although similar data are not available with the use of other estrogens, it cannot be presumed they would not induce similar changes Several reports suggest an association between intrauterine exposure to female sex hormones and congenital anomalies, including congenital heart detects and limb reduction defects. One case control study estimated a 4 7-fold increased risk of limb reduction defects in infants exposed in utero to sex hormones (oral contraceptives, hormone withdrawal tests for pregnancy, or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment The data suggest that the risk of limb reduction defects in exposed fetuses is somewhat less than 1 per 1,000 In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well controlled studies that progestogens are effective for these uses. If PREMARIN is used during pregnancy, or if the patient becomes pregnant while taking this drug, she should be apprised of the potential risks to the fetus, and the advisability of pregnancy continuation

DESCRIPTION: PREMARIN (conjugated estrogens, USP) contains a mixture of estrogens, obtained exclusively from natural sources, blended to represent the average composition of material derived from pregnant mares' urine It contains estrone, equilin, and 17α-dihydroequilin, together with smaller amounts of 17α-estradiol, equilenin, and 17α-dihydroequilenin as salts of their sulfate esters Tablets are available in 0.3 mg, 0 625 mg, 0 9 mg, 1.25 mg, and 2 5 mg strengths of conjugated estrogens Cream is available as 0 625 mg conjugated estrogens per gram

INDICATIONS AND USAGE: PREMARIN (conjugated estrogens tablets, USP): Moderate-to-severe *vasomotor* symptoms associated with the menopause (There is no evidence that estrogens are effective for nervous symptoms or depression without associated vasomotor symptoms and they should not be used to treat such conditions) **Osteoporosis (abnormally low bone mass)**. Atrophic vaginitis Kraurosis vulvae Female castration.

PREMARIN (conjugated estrogens) Vaginal Cream is indicated in the treatment of atrophic vaginitis and kraurosis vulvae PREMARIN HAS NOT BEEN SHOWN TO BE EFFECTIVE FOR ANY PURPOSE DURING PREGNANCY AND ITS USE MAY CAUSE SEVERE HARM TO THE FETUS (SEE BOXED WARNING).

Concomitant Progestin Use: The lowest effective dose appropriate for the specific indication should be utilized Studies of the addition of a progestin for 7 or more days of a cycle of estrogen administration have reported a lowered incidence of endometrial hyperplasia Morphological and biochemical studies of the endometrium suggest that 10 to 13 days of progestin are needed to provide maximal maturation of the endometrium and to eliminate any hyperplastic changes Whether this will provide protection from endometrial carcinoma has not been clearly established There are possible additional risks which may be associated with the inclusion of progestin in estrogen replacement regimens (See PRECAUTIONS) The choice of progestin and dosage may be important, product labeling should be reviewed to minimize possible adverse effects

CONTRAINDICATIONS: Estrogens should not be used in women (or men) with any of the following conditions: 1 Known or suspected cancer of the breast except in appropriately selected patients being treated for metastatic disease 2 Known or suspected estrogen-dependent neoplasia 3. Known or suspected pregnancy (See Boxed Warning). 4 Undiagnosed abnormal genital bleeding 5 Active thrombophlebitis or thromboembolic disorders 6 A past history of thrombophlebitis, thrombosis, or thromboembolic disorders associated with previous estrogen use (except when used in treatment of breast or prostatic malignancy).

WARNINGS: Long-term continuous administration of natural and synthetic estrogens in certain animal species increases the frequency of carcinomas of the breast, cervix, vagina, and liver. There are now reports that estrogens increase the risk of carcinoma of the endometrium in humans. (See Boxed Warning.) At the present time there is no satisfactory evidence that estrogens given to postmenopausal women increase the risk of cancer of the breast, although a recent study has raised this possibility There is a need for caution in prescribing estrogens for women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease or abnormal mammograms A recent study has reported a 2- to 3-fold increase in the risk of surgically confirmed gallbladder disease in women receiving postmenopausal estrogens

Adverse effects of oral contraceptives may be expected at the larger doses of estrogen used to treat prostatic or breast cancer or postpartum breast engorgement; it has been shown that there is an increased risk of thrombosis in men receiving estrogens for prostatic cancer and women for postpartum breast engorgement Users of oral contraceptives have an increased risk of diseases, such as thrombophlebitis, pulmonary embolism, stroke, and myocardial infarction. Cases of retinal thrombosis, mesenteric thrombosis, and optic neuritis have been reported in oral contraceptive users An increased risk of postsurgery thromboembolic complications has also been reported in users of oral contraceptives It feasible, estrogen should be discontinued at least 4 weeks before surgery of the type associated with an increased risk of thromboembolism, or during periods of prolonged immobilization Estrogens should not be used in persons with active thrombophlebitis, thromboembolic disorders, or in persons with a history of such disorders in association with estrogen use They should be used with caution in patients with cerebral vascular or coronary artery disease Large doses (5 mg conjugated estrogens per day), comparable to those used to treat cancer of the prostate and breast, have been shown to increase the risk of nonfatal myocardial infarction, pulmonary embolism and thrombophlebitis When doses of this size are used, any of the thromboembolic and thrombotic adverse effects should be considered a clear risk

Benign hepatic adenomas should be considered in estrogen users having abdominal pain and tenderness, abdominal mass, or hypovolemic shock. Hepatocellular carcinoma has been reported in women taking estrogen-containing oral contraceptives Increased blood pressure may occur with use of estrogens in the menopause and blood pressure should be monitored with estrogen use A worsening of glucose tolerance has been observed in patients on estrogen-containing oral contraceptives. For this reason, diabetic patients should be carefully observed Estrogens may lead to severe hypercalcemia in patients with breast cancer and bone metastases.

PRECAUTIONS: Physical examination and a complete medical and family history should be taken prior to the initiation of any estrogen therapy with special reference to blood pressure, breasts, abdomen, and pelvic organs, and should include a Papanicolaou smear. As a general rule, estrogen should not be prescribed for longer than one year without another physical examination being performed. Conditions influenced by fluid retention such as asthma, epilepsy, migraine, and cardiac or renal dysfunction, require careful observation Certain patients may develop manifestations of excessive estrogenic stimulation, such as abnormal or excessive uterine bleeding, mastodynia, etc. Prolonged administration of unopposed estrogen therapy has been reported to increase the risk of endometrial hyperplasia in some patients Oral contraceptives appear to be associated with an increased incidence of mental depression. Patients with a history of depression should be carefully observed Preexisting uterine leiomyomata may increase in size during estrogen use The pathologist should be advised of estrogen therapy when relevant specimens are submitted If jaundice develops in any patient receiving estrogen, the medication should be discontinued while the cause is investigated. Estrogens should be used with care in patients with impaired liver function, renal insufficiency, metabolic bone diseases associated with hypercalcemia, or in young patients in whom bone growth is not complete If concomitant progestin therapy is used, potential risks may include adverse effects on carbohydrate and lipid metabolism

The following changes may be expected with larger doses of estrogen:

a. Increased sulfobromophthalein retention.

b Increased prothrombin and factors VII, VIII, IX, and X, decreased antithrombin 3, increased norepinephrine-induced platelet aggregability.

c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by PBI, T4 by column, or T4 by radioimmunoassay Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered

d Impaired glucose tolerance

e. Decreased pregnanediol excretion.

f. Reduced response to metyrapone test.

g Reduced serum folate concentration.

h Increased serum triglyceride and phospholipid concentration. As a general principle, the administration of any drug to nursing mothers should be done only when clearly necessary since many drugs are excreted in human milk

ADVERSE REACTIONS: The following have been reported with estrogenic therapy, including oral contraceptives: breakthrough bleeding, spotting, change in menstrual flow; dysmenorrhea; premenstrual-like syndrome; amenorrhea during and after treatment; increase in size of uterine fibromyomata; vaginal candidiasis, change in cervical erosion and in degree of cervical secretion; cystitis-like syndrome; tenderness, enlargement, secretion (of breasts); nausea, vomiting, abdominal cramps, bloating; cholestatic jaundice; chloasma or melasma which may persist when drug is discontinued; erythema multiforme; erythema nodosum; hemorrhagic eruption; loss of scalp hair, hirsutism; steepening of corneal curvature, intolerance to contact lenses; headache, migraine, dizziness, mental depression, chorea; increase or decrease in weight; reduced carbohydrate tolerance; aggravation of porphyria, edema; changes in libido

ACUTE OVERDOSAGE: May cause nausea, and withdrawal bleeding may occur in females

DOSAGE AND ADMINISTRATION:

PREMARIN® Brand of conjugated estrogens tablets, USP

1. *Given cyclically for short-term use only.* For treatment of moderate to severe *vasomotor* symptoms, atrophic vaginitis, or kraurosis vulvae associated with the menopause (0.3 to 1.25 mg or more daily). The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible Administration should be cyclic (eg, three weeks on and one week off). Attempts to discontinue or taper medication should be made at three- to six-month intervals

2. *Given cyclically* Female castration. Osteoporosis. Female castration—1 25 mg daily, cyclically Adjust upward or downward according to response of the patient For maintenance, adjust dosage to lowest level that will provide effective control. Osteoporosis —0 625 mg daily Administration should be cyclic (eg, three weeks on and one week off).

Patients with an intact uterus should be monitored for signs of endometrial cancer and appropriate measures taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding

PREMARIN® Brand of conjugated estrogens Vaginal Cream

Given cyclically for short-term use *only* For treatment of atrophic vaginitis or kraurosis vulvae

The lowest dose that will control symptoms should be chosen and medication should be discontinued as promptly as possible

Administration should be cyclic (eg, three weeks on and one week off).

Attempts to discontinue or taper medication should be made at three-to-six month intervals.

Usual dosage range: 2 to 4 g daily, intravaginally, depending on the severity of the condition.

Treated patients with an intact uterus should be monitored closely for signs of endometrial cancer and appropriate diagnostic measures should be taken to rule out malignancy in the event of persistent or recurring abnormal vaginal bleeding

References:

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Letters to the Editor

Colorectal Health Check

Dear Physicians:

The American Cancer Society has implemented a three-year national educational program entitled "Colorectal Health Check." The purpose of this project is to increase public and professional awareness of the incidence, presentation, and screening techniques of colorectal cancer. Recommended detection procedures include digital-rectal examination, stool blood test, and proctosigmoidoscopy. "CHECK" is an educational rather than a screening program, and recipients of information are advised to contact their physician for implementation of these procedures.

Specifically, educational material includes the following instructions:

If you are over 40:

- Ask for a digital-rectal exam (physician examination of the rectum) every year.

If you are 50 or over:

- Ask for the digital-rectal exam *and* the stool blood test every year. For it you'll follow certain dietary restrictions before preparing three stool slides at home over a three-day period. The stool samples are checked by a qualified technician for hidden blood, which could indicate cancer.
- Ask about a procto exam (physician examination of the lower colon and rectum through a hollow lighted tube). Once you've had two annual negative procto exams, you should have one every 3 to 5 years.

As physicians we may expect to be asked about and should be aware of these recommendations. Our response and our cooperation will determine the success of this project in decreasing the mortality rate of colorectal cancer.

For more information, including instructional materials, please contact the librarian at the American Cancer Society (612) 925-2772.

Kirk W. Simpson, M.D.
Chairperson, Professional Education Committee
Hennepin County American Cancer Society

Smoke-Free

Dear Editor

On Page 533 in the September 1986 issue of *Minnesota Medicine*, there was a list of Minnesota smoke-free health care facilities. While a number of johnny-come-lately institutions were listed, the first smoke-free health care facility in the state was omitted.

The Olmsted Medical Group, since 1970, had limited smoking to the entry vestibules and one employee lounge. On November 1, 1984, smoking was completely eliminated from all of our facilities. This was accomplished with no difficulty and minimal dissent. It is really easy to do; all you have to do is decide to do it.

G. Richard Geier, M.D.
President
Olmsted Medical Group
Rochester, Minnesota

Dear Editor:

I was interested to read your listing of smoke-free health care facilities in the September 1986 issue of *Minnesota Medicine*.

It made me feel good that more and more clinics and hospitals are becoming smoke-free, and it also made me quite proud that our own clinic, the Owatonna Clinic, has been smoke-free since May of 1985, predating all the clinics and hospitals in your listing. Although with only 15 physicians our clinic is not as large as any of those you had listed, I still feel it is important for the smaller towns and communities and their physicians to take a strong stand against cigarette smoking in health care facilities.

Mark E. Loehrke, M.D.
Internal Medicine Department
Owatonna Clinic, P.A.
Owatonna, Minnesota 55060

The editors apologize for these and any other omissions and ask that completely smoke-free health care facilities not mentioned in the September 1986 issue of Minnesota Medicine notify the Minnesota Coalition for a Smoke-Free Society 2000, 2221 University Avenue SE, Suite 400, Minneapolis, MN 55414, so they can be added to the Coalition's smoke-free list.

A Means Test for Medicare

Dear Editor:

We in Minnesota are perhaps uniquely able to witness the consequences of fragmenting the insurance risk pool. With the growth of HMOs, self-insured corporations, and with an increasing percentage of our population totally uninsured, the race to shift costs and expensive patients out of one particular system seems to be accelerating. This raises the inevitable question of the future of third-party financing of health care. It seems to me that we have two basic alternatives:

1) National health insurance that would entitle all persons to basic health care of some sort.

2) Restructuring the current private sector reimbursement mechanisms so that persons with actual need for medical care can be identified and their care reimbursed.

As Dr. Reece has repeatedly outlined in his editorials, health care is a business, an industry, and there are many vested interests. Add to this the obvious profit motive and industrialization of medical care, it is obvious that any national health insurance plan would have to be implemented by the existing private sector mechanisms. But it is not hard to foretell the time when, with consolidations and mergers, a few larger corporate networks would be capable of providing comprehensive care for all U.S. citizens. Organized medicine has traditionally eschewed the creation of a national health insurance scheme. Physicians have avoided becoming employees of government; in fact, until recently, physicians generally have balked at becoming anyone's employee. Thus, the emerging trend of vertically integrated networks controlled by large corporations may be less galling to physicians than becoming civil servants in a publicly owned and administered system. However, this is probably a straw man. It is unlikely that systems such as those in Canada and in the United Kingdom will be publicly owned and administered without the influence of competition and private enterprise in the managerial role.

This leaves us with alternatives to a national health insurance scheme of some kind, albeit administered through a "competitive," vertically integrated, privately controlled mechanism.

The obvious need is to put a means test to the Medicare program. I am not sure that this is as politically unpalatable as many of our politicians say it is. It seems increasingly obvious that elderly millionaires might accept giving up their medical care within Medicare and that the outpatient reimbursement in Medicare, for example, the paltry $250 maximum on OP mental health benefits in a year, does not provide adequate coverage for the needs of the elderly.

Thus, I suggest that organized medicine, and perhaps *Minnesota Medicine*, should encourage discussion around putting the means test to the Medicare program.

Lee Beecher, M.D.
Psychiatrist
St. Louis Park, Minnesota

Pyloric Stenosis - Stang (continued from page 670)

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

NOVEMBER, 1986

1 **Bioethics Seminar: When is Limited Treatment the Best Treatment?** St. Paul-Ramsey Medical Center; Education Bldg., Amphitheater, St. Paul-Ramsey Medical Center, St. Paul, Minnesota. CONTACT: Kathleen Fritz, CME, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3992.

1 **Minnesota Society of Anesthesiologists Fall Scientific Meeting** Minnesota Society of Anesthesiologists; L'hotel Sofitel, Bloomington, Minnesota. CONTACT: Douglas E. Koehntop, M.D., University Anesthesiologists, PA, Box 294, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 373-8826.

1 **4th Annual Clinical Review for Physicians—1986—Management of Far Advanced Heart Disease** Midwestern Heart-Lung Institute; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Wendy K. Wolf, Coordinator, 2545 Chicago Avenue, Suite 611, Minneapolis, Minnesota 55404; (612) 871-4771.

2 **ENT for Primary Care Physicians** Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

3-5 **Clinical Reviews** Mayo Clinic/Mayo Foundation; Mayo Clinic, 200 First Street SW, Rochester, Minnesota. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

7 **Regional Conference on Angioplasty** Abbott Northwestern Hospital; Marriott City Center, Minneapolis, Minneosta. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461

7 **Primary Care of Common Trauma Injuries** North Memorial Medical Center; North Memorial Medical Center, Robbinsdale, Minnesota. CONTACT: Allen VanBeek, M.D., 3366 Oakdale North, Suite 504, Robbinsdale, Minnesota 55422; (612) 588-0593.

7-8 **Laser Surgery in Dermatology and Plastic Surgery** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

8 **Neurology Update** St. Paul-Ramsey Medical Center; St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota. CONTACT: Ruth K. McIntyre, Director, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

8-9 **Minnesota Society of Neurological Sciences 1986 Annual Scientific Meeting** Minnesota Society of Neurological Sciences; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Susan Anton-Johnson, Executive Secretary, 4225 Golden Valley Road, Minneapolis, Minnesota 55422; (612) 725-6767.

14 **Pediatric Orthopedics: Relevant Concepts for the Practitioner** Minneapolis Children's Medical Center; Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota. CONTACT: Kathy Ingerson, Minneapolis Children's Medical Center, 2525 Chicago Avenue South, Minneapolis, Minnesota 55404; (612) 874-5884.

14-15 **Seventh Annual Seminar for CME Directors** Minnesota Medical Association; St. Paul Hotel, 350 Market Street, St. Paul, Minnesota. CONTACT: Eugenia C. Kassar, Director of CME and Meeting Services, Minnesota Medical Association, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

17-21 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

18 **Advanced Cardiac Life Support Certification Course** Abbott Northwestern Hospital, Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

22 **Oncology Symposium** Metropolitan Medical Center; Metropolitan Medical Center, Minneapolis, Minnesota. CONTACT: Dan McGinty, 900 South 8th Street, Minneapolis, Minnesota 55404; (612) 347-4727.

23 **American College of Physicians, Minnesota Chapter, Regional Meeting** American College of Physicians; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, Minnesota. CONTACT: Alvin L. Schultz, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55404; (612) 347-2702.

DECEMBER, 1986

1-5 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

4-6 **Cardiopulmonary Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

5 **19th Annual Symposium on Obstetrics and Gynecology** North Memorial Medical Center; North Memorial Medical Center, Robbinsdale, Minnesota. CONTACT: Frank Czerniecki, M.D., 3366 Oakdale North, Suite 601, Robbinsdale, Minnesota 55422; (612) 588-0703.

6 **Epilepsy Update** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

JANUARY, 1987

16-17 **Laser Surgery in Otolaryngology** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55406; (612) 874-5461.

30 **Detection and Diagnosis of Substance Use Disorders** St. Paul-Ramsey Medical Center; St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

30-31 **Current Concepts of Cardiology** Abbott Northwestern Hospital; Holiday Inn, Alexandria, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

January 25 - February 1, 1987 **Grenadines/Orinoco River Air/Sea Cruise** North Central Medical Conference; Aboard the Ocean Princess. CONTACT: North Central Medical Conference, 1845 Hampshire Avenue, Suite 200, St. Paul, Minnesota 55116; (612) 698-1888.

FEBRUARY, 1987

2-6 **Updates in Clinical Gastroenterology** Mayo Clinic/Mayo Foundation, Buena Vista Palace, Lake Buena Vista, Florida. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

6 **Burn Care Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

6-7 **Current Concepts of Cardiology** Abbott Northwestern Hospital; Sawmill Inn, Grand Rapids, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

9-13 **Practical Concepts in Rheumatology and Musculoskeletal Disease** Mayo Clinic/Mayo Foundation; Sheraton Scottsdale, Scottsdale, Arizona. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnestoa 55905; (507) 284-2085.

13 **Minnesota Dermatological Society Melanoma Seminar and Winter Quarterly Meeting** Minnesota Dermatological Society; Hennepin County Medical Center, Minneapolis, Minnesota. CONTACT: J. Corwin Vance, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2332.

16-20 **Clinical and Laboratory Hematology: Current Issues** Mayo Clinic/Mayo Foundation; Maui Marriott, Lahaina, Maui, Hawaii. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

19-21 **Practical Clinical Neurology** Department of Neurology, Mayo Graduate School of Medicine; Americana Resort and Conference Center, Lake Geneva, Wisconsin. CONTACT: William Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-21 **Clinical Applications of the Nd: Yag Laser** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

21-28 **Rheumatology Symposium VI** Minnesota Medical Association Subcommittee on Rheumatic Diseases; South Seas Plantation, Captiva Island, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

26 **Advanced Cardiac Life Support Certification Course** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

MARCH, 1987

4-5 **Drug Therapy Symposium VIII** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

4-7 **Fifth Annual Critical Care Conference** St. Paul-Ramsey Medical Center, Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

13 **Psychiatry Specialty Course: DSM3** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware St. SE, Minneapolis, MN 55455; (612) 626-5525.

14-21 **Symposium on Sports Medicine** Minnesota Medical Association Subcommittee on Sports Medicine; Radisson Inn Maingate, (Orlando) Kissimmee, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

20-21 **Eighth Annual Occupational Medicine Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

21-22 **Lasers in Gynecology and Urology** Abbott Northwestern Hospital, Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, MN 55407; (612) 874-5461.

APRIL, 1987

2-4 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

3-4 **Colorectal Problems** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota 55455; (612) 626-5525.

6-7 **Annual Ophthalmology Course: Pediatric Stabismus** CME, Medical School, University of Minnesota; Holiday Inn-Downtown, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

9-10 **Obstetrics and Gynecology Update** CME, St. Paul-Ramsey Medical Center, Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

10-11 **Eating Disorders** CME, Medical School, University of Minnesota; Earle Brown Center, St. Paul, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

20-24 **Family Practice Review: Update 1987** CME, Medical School, University of Minnesota; Radisson Hotel South, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

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Opportunity For Physician with interest in Sports Medicine to provide medical consultation to a physical fitness program for public safety employees. Duties include performing periodic medical examinations, monitoring and interpreting graded exercise tests, interpreting spirograms, and performing limited administrative duties. Contact: David A. Paulson, M.D., at (612) 292-7726. (R)

Growing West Suburban Lake Minnetonka Clinic adding one full-time internal medicine physician. Multispecialty: Family Practice, Internal Medicine, OB/GYN, Surgery, Orthopedics, Urology, Ophthalmology, Optometry, Pediatrics. 16-physician clinic, three offices, quiet, rural area allowing easy access to downtown Minneapolis. Immediate interviewing. Forward CV to: Mound Medical Clinic, Ltd., 2208 Commerce Boulevard, Mound, Minnesota 55364. Attn: Diane Theis, Clinic Manager; (612) 472-1144. 2-11/86

Medical Practice Sales and Appraisals: We specialize in the valuation and selling of medical practices. If interested in buying or selling a medical practice, contact our Brokerage Division at The Health Care Group, 400 GSB Building, Bala Cynwyd, Pennsylvania 19004; (215) 667-8630. (R)

Orthopedic Opportunity to join existing three-man Board Certified orthopedic group. Opening July 1987. Send resume or CV to: Clinic of Orthopedic Surgery, Chartered, 73 East First Street, Fond du Lac, Wisconsin 54935. 3-12/86

Ophthalmologist, Internist-Cardiologist, Family Practice positions available with the Mankato Clinic, a 35-doctor multispecialty group practice in South-central Minnesota with a trade area population of 150,000. Salary first year, incentive thereafter, with full range of benefits and liberal time off. For more information, call R.F . Roskens, Administrator, or Dr. B.C. McGregor (507) 625-1811 or write: 501 Holly Lane, Mankato, Minnesota 56001. (R)

Minneapolis— Family Practice, Internal Medicine, Cardiology, Child Psychiatry, Adult Psychiatry, Obstetrics/Gynecology, Ophthalmology. Join established group in one of America's leading metropolitan areas. Group provides professional liability, four weeks vacation, two weeks conference leave, disability, retirement, hospital dues, and more. Must be board certified or board eligible. Direct inquiries to: Paul J. Brat, M.D., Medical Director, GROUP HEALTH, INC., 2829 University Avenue, SE, Minneapolis, Minnesota 55414. 2-11/86

Psychiatrist: BC/BE psychiatrist needed by our 150-member multispecialty medical staff and hospital in St. Cloud, Minnesota. Outstanding opportunity to establish a private practice with immediate income of $72,000 for 15 hrs/wk as medical director of hospital-based outpatient mental health program. An active 53-bed mental health unit psychiatric staff consisting of 3 psychiatrists, 2 psychologists, social workers, mental health nurses, and ancillary staff provides excellent clinical support. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 6-3/87

Wanted: Board Eligible/Certified Internist for primary care clinic near 75-bed hospital. Ideal community of 20,000 with a business area of 60,000 centered in a four-season recreational area. Specialty medical services available locally. Incentive earnings plan, insurance, and retirement plans available. Contact: Dennis Knudson, Administrator, LP Medical Clinic, 820 9th Street North, Virginia, Minnesota 55792. 5-2/87

Minnesota Family Practice Needed: one physician. Rural community mid-west Minnesota. Hospital-clinic-nursing home-based setting. Shared calls. Guaranteed income. Good specialty backup. For further information call: (612) 669-4421 or write: Community Memorial Hospital and Care Center, 812 10th Avenue, Clarkfield, Minnesota 56223. 2-11/86

Primary Care Physician: Opportunity for internist or family practitioner in north suburban area. Contact: Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, Minnesota 55429; (612) 533-8666. 3-12/86

Family Practice: Hastings Family Practice, PA, is looking for a female BC/BE FP to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send CV to: D.R. Eckes, M.D., 1280 Ninninger Road, Hastings, Minnesota 55033; or call (612) 437-8666. 3-12/86

Choice Downtown Medical Office to Share: Ideal for Internist or FP; (612) 224-7900. (R)

St. Peter, Minnesota: Available immediately. Position of senior staff physician to work with progressive and forward-looking staff and administration to meet the medical needs of the patients at St. Peter Regional Treatment Center. JCAH accredited. Delightful setting in the heart of the Minnesota River Valley. University town of 10,000, ten minutes from Mankato, and one hour from the Twin Cities. Salary range in high-60s to 70s for BC/BE according to experience with excellent fringe benefit package and an opportunity for expanding income through minimal call. An AA/EOE employer. For further information contact: S.K. McHutchison, M.D., Clinical Director, St. Peter State Hospital, 100 Freeman Drive, St. Paul, Minnesota 56082; (507) 931-7707. (R)

Family Physician wanted, board certified or eligible, to join three young family physicians in a growing family practice group. New facility. Northfield is a small attractive college town (St. Olaf and Carleton) and is less than one hour from the Twin Cities and Rochester. Contact: Kenneth Sansome, M.D., David Larson, M.D., or Mark Mellstrom, M.D., Family Physicians of Northfield, 505 West Woodley, Northfield, Minnesota 55057; (507) 663-1261. (R)

Physicians Needed Over 400 opportunities nationwide!! Call (612) 786-1929 or send CV to: Earl Czech, North Central Staff Services, Inc., 4175 Lovell Road, Suite 108, Circle Pines, Minnesota 55014. (R)

The University of South Dakota School of Medicine is seeking a board certified/eligible Internist to assist in the development and operation of a Women's Health Center. The position will include a university appointment as an assistant professor, involved in undergraduate and graduate training programs, as well as clinical activities with the Veterans Administration, ambulatory and inpatient care. Salary will be commensurate with credentials/experience. An excellent benefits package is included. For further information contact: Mary Ann Bauman, M.D., Assistant Professor, University of South Dakota School of Medicine, 2501 West 22nd Street, Sioux Falls, South Dakota 57105. (R)

Physician Practice Opportunities in the Chesapeake Bay or Tidewater Virginia area—especially attractive for physicians who would like to increase their fishing, powerboating, sailboating and other water-related activities from 3 to 4 months to 9 to 10 months per year and still live in an area with seasonal changes: spring flowers, sunny beaches, bright fall leaves, and winter snow. Medical Resources has been retained to conduct searches for: ENT/OTO, Family Practitioners, General Surgeon with thoracic and/or vascular training, GYN, Internal Medicine, IM/Cardio, IM/Gastro, IM/Pulmon, OB/GYN, Orthopedic Surgeons, Pediatricians, and Urologists. These are multispecialty group, partnership, and solo practice opportunities with visit and moving expenses, substantial salary, compensation, and/or practice support packages provided. Specific example: Orthopedic Surgeon needed for 16-physician multispecialty group in 50,000 population service area. Current group ORS most anxious to add another. You could live on the Chesapeake Bay with boat at your door 15 minutes from clinic and 135-bed hospital, 40 minutes from 650,000 population metro area. All opportunities represent *needs*. You would be needed, not just the 8th, 17th, or 31st in your specialty. For further information please call collect: (301) 261-8622, or forward detailed CV to: David P. Harrison, President, Medical

Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. All correspondence will be handled in a confidential manner. (R)

Physician Practice Opportunities - Birmingham, Alabama - Large multispecialty group seeking another OB/GYN, Family Practitioner, IM/Cardio, IM/Geriatric, and Emergency Medicine physicians. Visit expenses reimbursed. Call collect: (301) 261-8622 or forward detailed CV to: David P. Harrison, President, Medical Resources International, 302 Dream Landing Way, Annapolis, Maryland 21401. (R)

Good Samaritan Hospital is seeking a board eligible/certified Obstetrician/Gynecologist to join a well-established practice in Cincinnati. Excellent opportunity to practice quality medicine in a progressive, tertiary care teaching hospital with nationally recognized programs in medical education, residency training, and research. Contact: Recruitment Consultant Executive Offices, Good Samaritan Hospital, 3217 Clifton Avenue, Cincinnati, Ohio 45220. (R)

Family Practice: BC/BE Family Practitioner wanted to replace retiring third physician. Good practice potential and early partnership. Contact: Kathleen K. Simo, M.D., South Medical Clinic PA, 4310 Nicollet Avenue South, Minneapolis, Minnesota; (612) 827-3503. (R)

Internist needed for a busy, two-member practice in a community of 40,000 near Minneapolis, Minnesota. Competitive first year salary with incentive benefits and early partnership. Contact: Diagnostic Center, 304 Belle Avenue, Mankato, Minnesota 56001; (507) 388-1655. (R)

Green Bay, Wisconsin: 27-physician multispecialty group seeking BC/BE physicians in the following specialties: Family Practice, Ophthalmology, Dermatology, Plastic Surgery, Radiology, OB-GYN, Internal Medicine, and Pediatrics. Green Bay is a progressive community with an easy lifestyle, ample outdoor activities, excellent schools, and cultural activities. The Clinic offers competitive salary and excellent fringe benefits. Interested physicians please contact: W.J. Mommaerts, Administrator, West Side Clinic, sc, 1551 Dousman Street, Green Bay, Wisconsin 54303. (R)

Psychiatrist: An opening exists for a general psychiatrist with Hennepin Faculty Associates. Salary and benefits are generous. Requirements are: board eligibility, Minnesota licensure, and potential for appointment in the Department of Psychiatry at the University of Minnesota. Position would be largely involved with inpatient care of acutely ill patients at Hennepin County Medical Center and/or Metropolitan Medical Center. This would be in association with over a dozen other full-time psychiatrists engaged in clinical care, teaching, research, and forensics. Contact: William W. Jepson, M.D., Chief of Psychiatry, Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, Minnesota 55415. Phone: (612) 347-5764. (R)

Board Certified or Eligible Family Physician needed for an established clinic of five family physicians. No OB. Located in northern suburb of Twin Cities. Call: Marv Brooks, M.D., or Merle Mark, M.D.; (612) 533-2721. (R)

Family Practice opportunity with a busy, growing practice of young physicians. We are looking for a fifth doctor to join our clinic in Northfield, Minnesota, an attractive college community 30 miles south of the Twin Cities. As a progressive, yet historic-minded town, Northfield has a lot to offer the young family. Please contact: James M. Evans, M.D., or Gretchen D. Ehresmann, M.D., 710 South Division, Northfield, Minnesota 55057; (507) 645-5646 or (612) 375-0311. (R)

Wisconsin BC/BE Pediatrician for established hospital practice in northwestern Wisconsin. Attractive area with abundant cultural and recreational opportunities, competitive salary and benefits. Contact: Raymond Wolf; (414) 784-3258. (R)

Lake Superior: BC/BE Internist needed to join 2 young, quality-oriented general internists in a growing active practice. Natural beauty, small-town environment with sophisticated 105-bed hospital on the south shore of Lake Superior. Excellent salary and benefits. Write: Minnesota Medicine (802), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

1987 CME Cruise/Conferences on Selected Medical Topics - Caribbean, Mexico, Hawaii, Alaska, China/Orient, Scandinavia/Russia. 7-14 days year round. Approved for 20-24 CME Cat. 1 credits (AMA/PRA) and AAFP prescribed credits. Distinguished professors. Fly roundtrip free on Caribbean, Mexican, and Alaskan Cruises. Excellent group fares on finest ships. Registration limited. Pre-scheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Avenue, Huntington Station, New York 11746; (516) 549-0869. (R)

General Internist: We are in need of a qualified internist, preferred board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic loacted next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write: James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072; (612) 245-2212. 7-12/86

Family Practice— Associate needed to join four-man group, all ABFP, one member leaving soon due to health and family reasons. 65-miles north of Minneapolis, city of 2,200. Trade area of 10,000. Excellent 40-bed hospital. Regular specialty consults at clinic and hospital, and all new diagnostic facilities available on site. Top school system and recreational activities. Contact: Keith Clinic, PA, 160 SW Second Avenue, Milaca, Minnesota 56353; or call collect (612) 983-6101. 3-11/86

Family Practitioner needed to join a progressive 11-physician group. Liberal fringes and financial package. Thirty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. 4-12/86

General Internist to join our group of five family practitioners, one obstetrician, and one surgeon. We are located in a central Minnesota community of 9,000. Most aspects of internal medicine are available to this already established practice, including gastroscopy and invasive cardiovascular monitoring. Competitive salary with option to buy into group after one year. For information contact: Michael Neudecker, M.D., Medical Center PA; 209 First Street SE, Little Falls, Minnesota 56345; (612) 632-6611. (R)

Urologist Wanted: Board certified-board eligible needed to join a well established downtown practice in Minneapolis. Send CV to: Loren R. Keldahl, M.D., 825 South 8th Street, Suite 402, Minneapolis, Minnesota 55404. 4-12/86

Neurosurgeons: One or two American-trained, Board Certified/Eligible Neurosurgeons needed by our 150-member multispecialty (one neurosurgeon) Medical Staff and Hospital in St. Cloud, Minnesota. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

Neonatologist: Board Certified/Board Eligible American-trained Neonatologist needed to develop a Level III Nursery in Central Minnesota. Active support by 9-member Pediatric Department. Complete fully equipped Respiratory Department. Excellent Nursery Facility and Equipment. St. Cloud Hospital is a private Catholic non-profit 489-bed facility in central Minnesota located 70 miles northwest of Minneapolis/St. Paul. The hospital has a large (200,000 population) neurosurgical referral area and an excellently equipped Operating Room and Neurosurgical Intensive Care Unit. St. Cloud Hospital is a Level II trauma and emergency facility. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 5-11/86

Physician Opportunities available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write: Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

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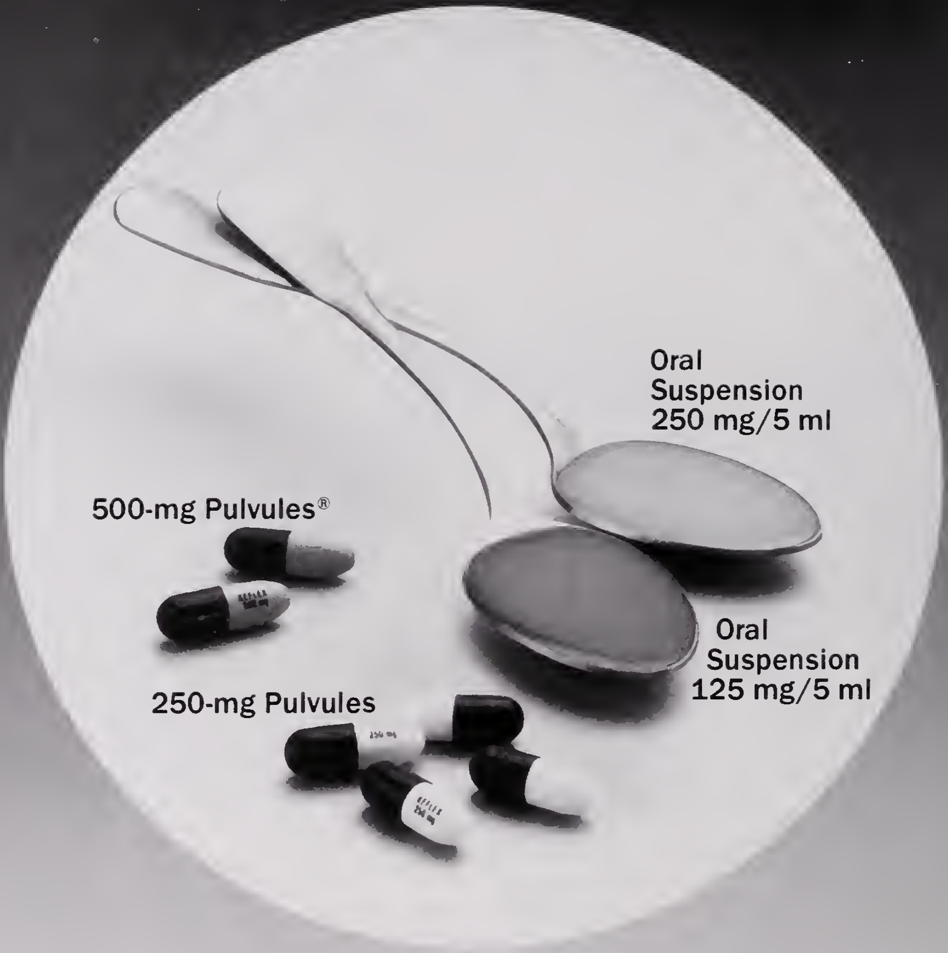
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Family Physician or General Internist needed for an established primary care clinic of four family physicians and a general surgeon. Guaranteed first-year salary with benefit program. Located in a small town on the beautiful north shore of Lake Superior (service area population of 12,000) only 22 miles from Duluth, which provides excellent referral and continuing education resources. Call collect: (218) 834-2171, or write: Steve Bjorum, Executive Director, Community Health Center, Inc., 4th Street at 11th Avenue, Two Harbors, Minnesota 55616. (R)

Lutsen Sea Villa: two bedroom, two bath, with new kitchen. Completely furnished. Only 50' from the crashing waves of breathtakingly beautiful Lake Superior. Income program through Lutsen Resort available. $85,000 - $80,000. Call: Jim (612) 333-8361. (R)

Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

Immediate Opening: Family Practitioner—River Valley Medical Center is seeking two family practice board eligible/certified physicians for its multispecialty group of 16 physicians in Northwest Wisconsin. Excellent starting salary and comprehensive fringe benefit package the first year with full group membership after one year. Attached to a progressive 90-bed hospital. We are within 45 minutes of the St. Paul/Minneapolis area. Please contact: Dr. Carl Hansen, Recruitment Chairman, or Tom Halverson, Clinic Manager, 208 Adams Street South, St. Croix Falls, Wisconsin 54024; phone (715) 483-3221. (R)

Arizona-based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years' experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

Canterbury Inn Bed & Breakfast: Rochester's unique alternative to hotel living. Victorian charm with modern comforts. Private baths, fireplace, central air conditioning, gourmet or special diet breakfast anytime, "tea-time" (wine, hors d'oeuvres, etc.) daily. Private, off-street parking, three blocks to Mayo Clinic and St. Mary's. A very special place for you, your colleagues, and your patients while in Rochester. $50/single, $60/double. 723 Second Street SE, Rochester, Minnesota 55902; (507) 289-5553. (R)

Bemidji Clinic, Ltd. offers excellent opportunities for well-trained physicians. We are seeking board certified or board eligible physicians in family practice, internal medicine with interest in pulmonary medicine or cardiology, ear/nose/throat, and obstetrics/gynecology. Bemidji Clinic is a 24-physician multispecialty group practice located in the beautiful north country of Minnesota. Generous first-year salary and benefit program. Contact: C.C. Lowery, Clinic Administrator, or N.A. Skogerboe, M.D., Medical Director; (218) 751-1280. (R)

Wanted: Family Practitioner—Ob/Gyn Group practice, central Minnesota. Starting salary $55,000. Write: Minnesota Medicine (755), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Family Practice: Northridge Family Medicine Clinic, PA, is looking for a fourth BE/BC FP to practice in our new clinic facilities in Mankato. Contact: Tony Giefer, M.D., 1695 LorRay Drive, North Mankato, Minnesota 56001; or call (507) 345-5293. (R)

Orthopedic Surgeon Wanted: Board Eligible/Certified Surgeon interested in tremendous career opportunity serving a progressive rural health care community in South-central Minnesota. Fairmont Community Hospital and adjoining clinic and four regularly referring clinics seek an individual interested in establishing an orthopedic surgery practice in Fairmont, Minnesota. The hospital is well-equipped with a new in-house Phillips Tomoscan 60TX Cat Scanner, a progressive PT department, and well-equipped surgery department. Fairmont is unique with five lakes within the city limits, four of which are connected by channels. Outdoor activities include boating, fishing, hunting, cross-country skiing, tennis, golf, etc. Interested parties should contact: Administrator, Fairmont Community Hospital, 835 Johnson Street, Fairmont, Minnesota 56031. 2-11/86

OB-GYN needed for busy, modern practice with one female board certified OB-GYN in suburban St. Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

FAMILY PRACTICE, INTERNAL MEDICINE, AND GENERAL SURGERY positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

FAMILY PRACTICE: Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic PA, 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

FAMILY PHYSICIAN needed to replace retiring partner in thriving 3-FP full-service practice in Starbuck, Minnesota, on the state's 13th largest lake. Good hunting and fishing. Modern 9-year-old hospital. Twenty miles to university campus. Call or write: Robert Bosl, M.D., Starbuck Clinic, PA, Starbuck, Minnesota 56381; (612) 239-2231. (R)

PHYSICIAN PRECEPTOR in Family Practice. Upper Peninsula Health Education Corporation is accepting applications for a full-time family physician in a unique, rural medical education center. Responsibilities are patient care including obstetrics and clinical instruction of medical students of the Upper Peninsula campus of Michigan State University's College of Human Medicine. Requirements are board eligibility or certification in family practice with a commitment to medical education. Salary and rank commensurate with experience. Send inquiries to: John Hickner, M.D., Bay de Noc Family Health Center, Doctors Park, Escanaba, Michigan 49829; (906) 786-9510. 4-11/86

FAMILY PHYSICIAN/EMERGENCY ROOM: Full-time salary working weekends, primarily emergency room. Flexibility available. Falls Medical Center, PA, 105 Shorewood Drive, International Falls, Minnesota 56649. Please contact: Douglas A. Johnson, M.D., or A. Marc Gorden, M.D., at (218) 283-9431 for more information. (R)

GENERAL INTERNIST: The St. Cloud Medical Group located in Central Minnesota has an immediate opening for a general internist to join a 23-physician, multispecialty group in St. Cloud, Minnesota. The department of internal medicine currently has four board certified internists, and is in the process of recruiting an additional board certified internist to that department. This opportunity affords a general internist a great financial and working opportunity. St. Cloud is one of the fastest growing communities in the state of Minnesota and is home to three major colleges. It is geographically located to provide quick access to the Metropolitan Twin Cities area. The St. Cloud community has excellent school systems available to the individual physician and his or her family members. If interested in this excellent opportunity, please call collect either Dr. Ronald Elg and/or Daryl G. Mathews, Administrator, at (612) 251-8181, and/or send CV to: St. Cloud Medical Group, PA, 1301 West St. Germain Street, St. Cloud, Minnesota 56301. 4-11/86

ORTHOPEDIC SURGEON BC/BE 435,000 gross established practice available in multispecialty clinic of 16 board certified physicians in family practice, internal medicine, pediatrics, orthopedics, general surgery, and emergency medicine. Associate physician regular visits in neurology, oncology, otolaryngology, pathology, and radiology. Other specialties in town are ophthalmology and urology. Historic city of 15,000 located 90 minutes south of Minneapolis metro area, 30 minutes from Mankato State University. Well-balanced economy between Kraft, 3M, Pantasote, AMPI, and agri-businesses. Three excellent school systems in addition to a college. Write: Minnesota Medicine (803), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. 4-2/87

Wisconsin—Lake Geneva Area: Well-estabablished family physician seeking partner. Solo options also available. Full scope of family medicine. Community of 6,000 is ten minutes from 130-bed JCAH facility. Less than one hour drive to both Madison and Milwaukee. Salary plus production incentive or guaranteed income first year. For complete information, please forward CV or telephone collect: Thomas Campbell, Fox Hill Associates, One Greentree Centre, Suite 201, Marlton, New Jersey 08053; (609) 596-0661. 1-11/86

Wisconsin—Green Bay Area: New clinic being constructed 15 minutes from 158-bed medical center constructed in 1981. Associate with two board certified family physicians or establish solo. Six physician weekend rotation. OB desired. Guaranteed income plus rent-free space. Two-doctor clinic to be completed fall 1986. For complete information, please forward CV or telephone collect: Thomas Campbell, Fox Hill Associates, One Greentree Centre, Suite 201, Marlton, New Jersey 08053; (609) 596-0661. 1-11/86

Wisconsin—Lake Michigan Shoreline: Eight-physician primary care group located in community of 14,000. Call shared with four family physicians in group. OB desired. Salary plus first-year bonus plan. Internist, OB/GYN, pediatrician, and general surgeon in group. South of Door County peninsula. For complete information, please forward CV or telephone collect: Thomas Campbell, Fox Hill Associates, One Greentree Centre, Suite 201, Marlton, New Jersey 08053; (609) 596-0661. 1-11/86

Wisconsin—Fox River Valley: Three board certified family physicians seeking fourth. OB desired. College in community of 7,500. Excellent hospital facility in community. Call rotation every fifth night and every sixth weekend. Physicians rotate through two branch clinics. Guaranteed salary with productivity first year. Less than one half-hour drive to Lake Winnebago. For complete information, please forward CV or telephone collect: Thomas Campbell, Fox Hill Associates, One Greentree Centre, Suite 201, Marlton, New Jersey 08053; (609) 596-0661. 1-11/86

Wisconsin—Madison Area: One family physician to join board certified family physician and one board certified internist located 30 minutes from downtown Madison. OB necessary. Well-equipped hospital in this community of 4,000. ER call schedule one night a week and every sixth weekend. OB call will be shared among three family physicians. Guaranteed income and full benefits. For complete information, please forward CV or telephone collect: Thomas Campbell, Fox Hill Associates, One Greentree Centre, Suite 201, Marlton, New Jersey 08053; (609) 596-0661. 1-11/86

Family Physician Wanted for 5-physician partnership in northern suburb of the Twin Cities. Competitive salary and benefits. Opportunity to contribute to future direction of the practice. Contact: James Rusin, M.D., East Main Clinic, 850 East Main Street, Anoka, Minnesota 55303; (612) 421-7070. 3-1/87

Director of Medical Services: Are you ready for a change from Clinical Medicine? We have a full-time position available in Insurance Medicine. Primary duties involve answering medical questions from underwriters or claims reviewers, interpreting ECGs and chest X-rays, and doing occasional physical examinations. Excellent benefits, regular hours, and weekends free. Internal medicine specialty preferred. If interested, send a resume and salary history to: The Medical Department, PO Box 1143, Minneapolis, Minnesota 55440. 2-12/86

You Are Invited To Vacation this winter on St. Croix, the largest U.S. Virgin Island in a beautiful 2-bedroom, 2-bath villa with ocean views. Beach, pool, tennis, golf in season. $1300/week. Call for information/photos: (612) 933-8046. 1-11/86

Family Practitioner and General Internist to join 7-physician clinic in Cloquet, Minnesota, a community of 14,000 (30,000 service area), located 20 minutes from Duluth-Superior. The clinic facility is located one block from modern, well-equipped hospital. Cloquet enjoys a stable economy (forest products). Additionally, our community is noted for its excellent school system. First-year salary guarantee, paid malpractice, health and disability insurance, vacation, and study time. Contact: John Turonie, Administrator, Raiter Clinic, Ltd., 417 Skyline Boulevard, Cloquet, Minnesota 55720; (218) 879-1271. (R)

Family Practice: Busy, growing practice of young family physicians is looking for a fifth doctor to join our group. Our clinic is located in Northfield, Minnesota, an attractive college community 30 miles south of the Twin Cities. As an historic minded, yet progressive town, Northfield has a lot to offer the young family. Please contact: Gretchen D. Ehresmann, M.D., 710 South Division, Northfield, Minnesota 55057; (507) 645-5646, (612) 375-0311. 1-11/86

Pediatricians Attention: Rare opportunity available to locate with a well-established medical group in Highland Park, St. Paul, Minnesota—a thriving community of prosperous residents in need of a pediatrician. Write or call: Highland Medical Building, 670 South Cleveland Avenue, St. Paul, Minnesota 55116; (612) 698-3828. 1-11/86

Pediatrician: Exciting opportunity to join male and female pediatricians in practice consisting of both primary and consultative pediatrics. Individuals interested in a leadership position to head the Department of Pediatrics, Board Eligible or Certified and with neonatology expertise should apply. Practice is with a 50+ physician multispecialty group located in Minneapolis suburban area (15 minutes from downtown). Interested applicants contact: Tom Behrend, Columbia Park Medical Group, 6200 Shingle Creek Parkway, Suite 480, Brooklyn Center, Minnesota 55430; (612) 560-3450. 3-1/87

OB/GYN:Young female and male seeking a third physician to join us in our busy OB/GYN practice. We are a 54-physician multispecialty clinic in the suburban Minneapolis area. Practice offers utilization of one hospital, full day off during week, and opportunity to chair clinic OB department. Must be Board Certified or Board Eligible. Feel free to contact: Dr. Lori Radke (612) 559-7432 or send CV to: Tom Behrend, Columbia Park Medical Group, 6200 Shingle Creek Parkway, Suite 480, Brooklyn Center, Minnesota 55430; (612) 560-3450. 3-1/87

Internal Medicine: Interstate Medical Center is seeking general internist, BC/BE to join 27-physician multispecialty group. Contact: John Walsh, M.D., Interstate Medical Center, PA, Highway 61 West, Red Wing, Minnesota 55066; (612) 388-3503. 4-2/87

Family Practitioner board certified or eligible to join 11-physician, expanding multispecialty practice in northern Wisconsin. Clinic adjoins JCAH hospital. Rural location with abundant outdoor recreational opportunities, small four-year college. Excellent salary and benefits. Call collect: (715) 532-6651 or send CV with names of references to: Marshfield Clinic - Ladysmith Center, Howard T. Chatterton, M.D., 906 College Avenue West, Ladysmith, Wisconsin 54848. 3-1/87

Family Practice/OB opportunity available immediately in central Minnesota. Guaranteed salary with excellent benefit package, full partnership potential. JCAH 32-bed full-service hospital with CAP lab, radiology, surgery, ER operated by progressive investor-owned multi-hospital corporation. Also excellent school facilities. Call or write: Debra Noble, St. John's Hospital, Browerville, Minnesota, (612) 594-2204, or Dr. Russell Brown, Todd County Medical Center, (612) 594-2231. 1-11/86

Suburban FP Group —SHARE affiliate—seeks associate to service rapid practice growth. Competitive salary and benefits. Unique opportunity to establish your practice. Contact: Gloria M. Vierling, Sundance Medical Clinics, Ltd., 323 Naumkeag Street, PO Box 9, Shakopee, Minnesota 55379; (612) 445-6440. (R)

Family Practitioner BC/BE to join group of six board certified family practitioners and a board certified general surgeon. We offer liberal educational and vacation allowances, excellent benefit package, guaranteed minimum salary first six months, with production bonus and membership opportunity. Montevideo is located in west-central Minnesota (population 5,600) with a draw area of 25,000. Our clinic is attached to a modern 35-bed hospital, both new in the late 70s. Please contact: Norman Hagberg, M.D., Montevideo Clinic PA, 908 North 11th Street, Montevideo, Minnesota 56265: (612) 269-6435, or Jim Noble, Administrator, Montevideo Clinic PA, (612) 269-6435. 3-1/87

For Sale —Family practice with or without clinic. County seat community. Excellent school, hospital, nursing home, nursing staff. Clinic—6 exam rooms, X-ray, lab, etc. Will finance and assist in establishing new M.D. Contact: H.A. Knoche, M.D., Gaylord Clinic, Ltd., 315 4th Street, Box 267, Gaylord, Minnesota 55334; (612) 237-2528. 6-4/87

Family Practice: Multispecialty group is seeking 2 family practitioners, BC/BE, to join 2 physicians in our Zumbrota branch office. Generous salary and outstanding fringe benefits. Contact: John Walsh, M.D., Interstate Medical Center, PA, Highway 61 West, Red Wing, Minnesota 55066; (612) 388-3503. 4-2/87

Classified Advertisements

FP/GP Locum Available for Work Lic. Minnesota, Wisconsin, SD, ND, Colorado, Utah, Missouri. Contact: Dr. Olin, 21450 Excelsior Boulevard, Excelsior, Minnesota 55331; (612) 474-1050. (R)

Gaylord Community Hospital is a seeking a family physician to serve its community of 2,000 population. 65-year-old physician retiring, and downtown clinic is for sale. Also have clinic attached to hospital. 32-bed hospital, 58-bed nursing home. Guaranteed fist year salary plus benefits. Contact: Richard Kons, Administrator (612) 237-2905, or write: PO Box 386, Gaylord, Minnesota 55334. 3-11/86, 1/87, 3/87

Emergency Physician: Waconia Emergency Physicians Group seeks part-time or full-time EM physician. 110-bed hospital located 30 miles from Minneapolis. Contact: Rob Welch, M.D., 500 South Maple, Waconia, Minnesota 55387; (612) 442-2191 or 448-7426. 2-12/86

Faculty Positions, Department of Surgery— The University of Iowa Department of Surgery invites applications for faculty positions of all ranks for M.D.s with special qualifications in: 1) all areas of general surgery and plastic surgery, 2) thoracic and cardiovascular surgery including peripheral vascular surgery and 3) neurosurgery. The University of Iowa does not overlook qualified candidates who are women or members of ethnic minority groups. *Written only* inquiries and CV direct to: R.J. Corry, M.D., Professor and Head, Department of Surgery, The University of Iowa College of Medicine, Iowa City, Iowa 52242. We are an Equal Opportunity/Affirmative Action employer. 1-11/86

Writing Assistance for medical journal articles, patient information brochures, marketing brochures. Ten years of experience in health care writing. Call Elaine Lampert, Freelance Writer (612) 447-5883. (R)

GENERAL INTERNIST

The Duluth Clinic, Ltd., a 130-physician multispecialty comprehensive regional medical center is actively seeking general internists. State of the art diagnostic equipment, surgical and hospital facilities are available.

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Cover Photograph

Weathered Rocks

Ishik C. Tuna, M.D., a surgical resident at the University of Minnesota, took the cover photograph during a trip through British Columbia. He used a Leicaflex SL camera with a Telyt 250 mm lens and Kodachrome film.

Dr. Tuna lives in Edina with his wife, Dr. Carolyn Hughs, and their daughter Cari. He plans to begin subspecialty training in cardiovascular surgery in 1988.

Old Fisherman's Shack

The old fisherman's shack featured on *Minnesota Medicine's* September cover was the old "John's Family Boat & Fish House" located on Johns Island, according to Robert E. Johns, Duluth, who carries the family name. Mr. Johns wrote: "This family dates back prior to the Civil War days, when they were commercial fishermen and mining captains in the old Windigo Mines at Washington Harbor, Isle Royale, Michigan."

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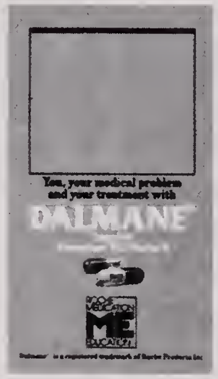
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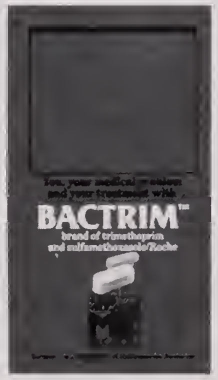
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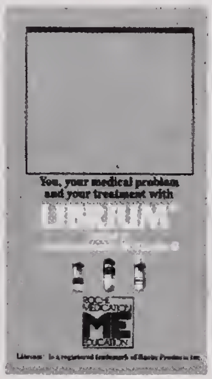
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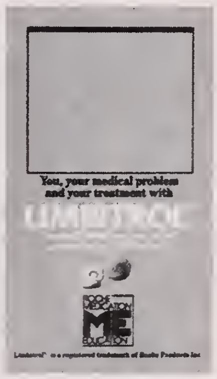
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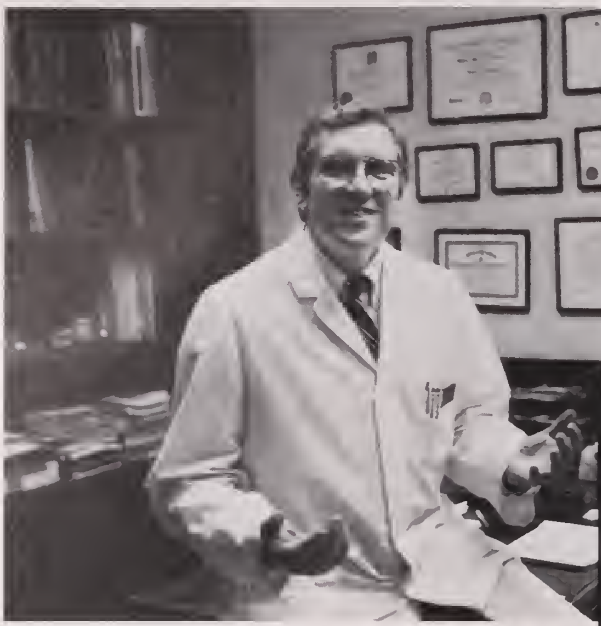

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President's Letter

The American Medical Association: A Strong National Voice for Physicians

James F. Knapp MD

James F. Knapp, M.D.
President
Minnesota Medical Association

Always at about this time of year, a few physicians ask me what I think of the American Medical Association (AMA) and what membership in the organization is worth to them.

While the benefits of AMA membership are more abstract than the basic benefits of state membership, the AMA is also profoundly important to today's — and tomorrow's — practice of medicine. I therefore decided it was important enough to devote one of my columns to discussing some of these benefits.

There are many activities that the AMA initiates and implements that no one else can or would do. It's a very democratic organization because it is a part of the federation of medicine; if physicians at the medical staff or county level want to be involved, they can be.

First and foremost of the activities is the lobbying effort at the nation's capitol. As in St. Paul, most of what AMA "wins" in Washington is measured by what doesn't happen, by what bills are blocked from passage. Without the AMA, we would certainly have Medicare mandatory assignment, suffer a much greater deluge of fringe health care providers, and have many more restrictions on our medical practice. While the concept of "bills which don't pass" is somewhat abstract, a negative bill most definitely affects our day-to-day practice. AMA's political arm, AMPAC, has impressively backed many successful candidates, assuring that the physician's voice is heard long before a newly elected congressman sets foot in Washington.

An example of a very successful lobbying effort that we don't immediately associate with AMA is the acceptance of tax deferred retirement plans. AMA played a key role in nursing Keogh legislation through Congress and more recently, the legislation that allows physicians to establish retirement funds through tax deferred savings. The benefits physicians receive from this AMA success are two-fold: I might be able to retire sooner *and* my retirement, along with many other physicians', will make room for our new medical doctors. The physician glut may not fully materialize if we break the tradition of staying in practice until the age of 70.

AMA is also a real clearinghouse of medical information. AMA's Council on Scientific Affairs digests, condenses, and produces white papers that are of value to us as practicing physicians. William Kennedy, M.D., of Minneapolis now serves on this Council.

The AMA produces other well-done and useful documents. It has developed a socioeconomic data base that no one else has. The polling and tabulations on the environment of medicine are excellent studies that offer us guidance on cracks to fill and proactive directions for the future.

A massive project begun in 1982 is known as *A Health Policy Agenda for the American People* (HPA). It was originally created to identify the major health care issues of both current and future importance and to develop a coherent plan for responding to them. Ultimately, according to the AMA, "the HPA will provide...a comprehensive framework for policy development and a basis for cooperative action to achieve long-term goals. New levels of consensus will be reached on many issues and where differences among organizations remain, they will be better understood."

The HPA has brought together 172 diverse organizations to first develop principles, issues statements, and, finally, recommendations. These recommendations or proposals will be released in January 1987. I would encourage all physicians to read the final report, digest the material, and then react to it, either by writing to me or the AMA directly.

(continued)

The amount of information amassed through the HPA project is incredible, and again, it is a project that would never have been done if not for the AMA. Will the final HPA proposals please all physicians? Probably not. But the HPA does offer us a better understanding of the positions of other groups and also a framework in which to work to achieve our goals.

This is a time of high frustration for physicians and it is very easy to place blame on our own organization rather than face the reality of the evolving medical environment. While AMA and/or MMA cannot protect us from that reality, these organizations continue to ease the sometimes tempestuous transitions we must face in order to survive and, most of the time, thrive.

I now serve as an AMA alternate delegate from Minnesota and have been a part of the development of the HPA. Because of these roles, I can speak from firsthand experience: the AMA continues to serve as a strong national voice for physicians.

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editor's notebook

Eulogy to Archie

By JOHN E. SMITH, M.D.

EDITOR'S NOTE: The practice of medicine means many things to many people: a profession, a science, a culture, and an economic activity. But of all callings, most observers agree, medicine is the most human. Nothing brings you so close to remarkable human beings like Archie Smith. I knew Archie, and I loved him. Once I even drew a cartoon of him, depicting him as an Old Shoe. What drew me to that metaphor were those heels, worn down by countless housecalls, and that magnificent Soul of his. This, the December issue of Minnesota Medicine, is a fitting place to pay homage to Archie. The best way to do so is to reprint the eulogy delivered by his son, Jack, a member of the Board of Editors of Minnesota Medicine, at his father's memorial service this autumn. *RLR*

Archie Smith, M.D.
October 30, 1904 - August 26, 1986

"I have seen death come slowly, like rust; and fast like a doorknob coming off in your hand when you leave the room." Those lines by physician poet John Stone apply to Dad because he had it both ways. Slow, because he was with us for 13 extra years after his first lung cancer surgery. "Death did not leap on us unaware, but gave us kindly warning to prepare." We all had plenty of time to say our goodbyes. Yet at the end, it was rapid and peaceful and painless. I had been dreading the event for years — half hoping that I would be out of town, but the end was easy for both of us.

"Go not gently into that good night, but rage, rage against the dying of the light." And he fought against the cancer for all of those years. Whatever it was that he had that allowed him to beat the cancer so successfully for so long, I hope he passed some of it along to his children and his grandchildren and his children's children's children.

I know of three other doctors who developed lung cancer the same year as Dad and they all died within a year. He was able to keep practicing and to enjoy medicine for another eight years, and to enjoy everything else for another five years beyond that. Even with all the trouble breathing the last year, he was grateful for the extension. In fact, the last thing he said to me was, "Thanks for everything, thanks a million."

He grew up on a farm, which would explain his love of the outdoors and his green thumb skill with growing things. From that background also came his fiercely independent nature. He liked to control his own destiny, to do more than his share, to be responsible for his own actions, and to take his own pills. In 1978, as he was coming out of the anesthesia from his second surgery, he told me he was thinking of retiring. His reasoning, stated in the idiom of this farming background, is memorable: "When you are part of a team and you don't pull your share of the load, your hind hoof hits the whiffletree."

In 1969, when I had been practicing with him for about ten years, I wrote that, "He is at heart a solo practitioner who tends to answer his own phone, likes to take his own X-rays, and will even do his own lab work on occasion. He is suspicious of big clinics, of committee decisions, and of group activity in general."

But those words, while accurate, were only one facet of the man and make him sound like the last angry man, and he was not. He was first and foremost a people person and was very responsive to the needs of those around him. There was no limit to the variety of his friendships and no barrier to the broad range of his interests. He was complex without being complicated. He was competitive, as shown by his cribbage and his bowling with the mighty Oaks; by his golf, where he loved to out drive the rest of the foursome using his old beat-up brassie instead of a driver; by his morning-glory growing contests; and by his enjoyment in having the first tomato on the block. He was someone to enjoy being with — a good companion on a hunt or a long car trip. The only thing that I didn't enjoy about practicing with him was that we never got to take a vacation together. In a two-man partnership when one is gone the other is working.

He had a unique way of using his fine intellect and his very perceptive feelings simultaneously. He was sensitive and caring. He was a fine family Doc, a good husband and father, and a super Grandpa. I can think of no higher praise.

Working with someone for 8 hours a day for 22 years, you get to know them pretty well, but to try to capture the essence of the man in a eulogy is still difficult. His skill as a surgeon lay in his ability to stay out of trouble, to anticipate the unexpected, to be conservative rather than radical. He practiced and preached the medical school dictum of, "First do no harm." His big warm hands were constantly holding and helping and fixing-up.

What I know of the art of medicine I learned from him. What we know of love we have learned from the example of our parents and two of the lasting gifts they have given us — and which we have tried to pass on to our children – one is roots, the other is wings. Tomorrow would have been their 57th anniversary.

I began with a physician's poem and will end with a physician's prayer that reminded me of him when I read it again last night.

Please Lord deliver me from:
The inability to leave well enough alone,
From excessive zeal for the new and contempt
for the old,
From putting knowledge before wisdom,
science before art, and cleverness before
common sense.
From treating patients as cases and
From making the cure more grievous than the
disease. Good Lord deliver us.
Amen. Amen. So be it and so it is . . .

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Morbidity and Mortality in Patients Receiving the Esophageal Obturator Airway and the Endotracheal Tube in Prehospital Cardiopulmonary Arrest*

IRVIN F. GOLDENBERG, M.D.+, BRIAN C. CAMPION, M.D.†, CONSTANCE M. SIEBOLD, R.N.++, JOHN W. McBRIDE, M.D.††, LINDA A. LONG, M.D.††

A retrospective study of 317 consecutive patients with out-of-hospital cardiopulmonary arrest was done to evaluate the impact of the esophageal obturator airway (EOA) and the endotracheal tube (ET) on morbidity and mortality. There was no significant difference (NS) in mortality, neurological sequelae or incidence of congestive heart failure in the EOA and ET groups. When patients receiving the EOA were compared to patients receiving both airways, there was a significantly higher rate of survival in the patients receiving the EOA (27/197 vs 0/33) ($P<.05$). The incidence of unsuccessful intubation attempts was higher with the ET (19.4%) than the EOA (1.7%) ($P<.001$). There was an 8.5% incidence of esophageal lacerations in autopsied patients receiving the EOA. We conclude that while the ET is the definitive adjunct for airway management in a cardiopulmonary arrest, the EOA is a satisfactory alternative for short-term use in the prehospital setting.

The optimal airway for respiratory management of a patient with a cardiopulmonary arrest is a well-placed endotracheal tube (ET). However, the placement of an ET tube requires a certain level of skill with training and recertification demanding substantial time and resources. Therefore, alternative methods for ventilation have been sought. The esophageal obturator airway (EOA) was developed as such an alternative. Despite its acceptance as a useful airway adjunct by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care in 1973[1] and 1979,[2] the efficacy of the EOA remains controversial.[3-7] To evaluate the efficacy of the EOA, we undertook a study to compare morbidity and mortality in patients receiving the EOA and/or ET in prehospital cardiopulmonary arrest.

Methods

Study Population

A retrospective study of an 18-month period was done to evaluate the impact of the EOA and ET on prehospital cardiopulmonary arrest mortality and morbidity. We evaluated 317 consecutive patients with out-of-hospital cardiopulmonary arrest whose destination was St. Paul-Ramsey Medical Center (SPRMC) or one other St. Paul, Minnesota, hospital. The only patients excluded were those whose type of airway could not be determined or in whom full resuscitative measures were not attempted upon paramedic arrival.

EOA

The EOA and its placement have been described in detail elsewhere.[1,2,8,9]

Care Providers

Paramedics (EMT-Ps) in the St. Paul, Minnesota, area were trained at SPRMC. All paramedics were trained in Advanced Cardiac Life Support (ACLS) according to American Heart Association (AHA) guidelines. All paramedics were trained in EOA intubation. A total of three hours was spent teaching each paramedic EOA insertion at a cost of approximately $80.00 per paramedic. The only practice paramedics had with EOA intubation prior to field use was on mannequins. In 1977, a program was begun to teach ET intubation to paramedics who volunteered. This course consisted of 20 hours of didactic work, demonstrations, and mannequin practice followed by ET intubation of 12-16 patients in the operating room. However, completion of the training was competency based, i.e., a paramedic was evaluated for proficiency by the Department of Anesthesiology prior to using the ET in the field. The cost of initial ET training was approximately $1000 per paramedic. Each paramedic is required to return to the operating room each year to demonstrate ET intubation under supervision.

---

*Performed at St. Paul-Ramsey Medical Center, St. Paul, Minnesota. Information presented at the 4th Purdue Conference on Cardiac Defibrillation and Cardiopulmonary Resuscitation, Purdue University, September 15-17, 1981. This study was supported in part by the Medical Education and Research Foundation at St. Paul-Ramsey Medical Center, St. Paul, Minnesota.

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During this study, all 85 paramedics were trained in EOA and 15 were trained in ET intubation. The type of airway a patient received depended on the paramedic at the scene; ET intubation was attempted by paramedics trained in its use and the EOA was attempted by all other paramedics. If ET intubation was unsuccessful, EOA intubation was usually attempted. Some patients received both airways. On all arrests, paramedics maintained contact by radio and telemetry with SPRMC. St. Paul-Ramsey Medical Center serves as a base station communication center for Ramsey, Washington, and Dakota counties. Orders for medication came from the base station physician. Cardiac arrests were treated according to AHA ACLS guidelines.

Patient Data, Analysis, Statistics

The 317 patients studied were divided into four groups: 1) EOA, 2) ET, 3) Both Airways (BA) — those getting both an EOA and ET, and 4) Neither Airway (NA) — those patients with unsuccessful placement of any airway. The first three groups (309 patients) were then compared using available data from paramedic run reports, emergency room (ER) records, and hospital charts. The data included: population characteristics (age, sex, past medical history, initial rhythm, and cause of arrest if known), immediate airway complications, arterial blood gases (ABGs), hospital course, and survival.

Statistical analysis was performed using chi square tests, Fisher's exact probability tests, and t-tests in evaluating the differences among the three groups. Statistical analysis was done between the ET group and the EOA group, between the ET group and the BA group, and between the EOA group and the BA group. The patients in the NA group were excluded from all analysis except the evaluation of successful airway placement. The statistical difference between the groups was considered to be significant at $P<.05$.

Results

Comparability of the Groups

Of the 317 prehospital arrests whose destination was one of the two hospitals, 197 patients received an EOA, 79 an ET, 33 both airways, and 8 had neither airway successfully placed. Of the 309 patients in the first three groups, age and sex could be determined from the report sheets in only 307. The ages in the three groups were similar (NS) with a mean of 61.9 years for the EOA, 62.0 years for the ET, and 63.4 years for the BA group. Among the groups, 230 (74.9%) were male and 77 (25.1%) were female. Age was similar for both male and female patients. The sex distribution was similar among the three groups.

The medical histories are listed in Table 1. There is no statistically significant difference among the three groups in any of the variables looked at including past cardiac history, diabetes, chronic obstructive pulmonary disease, and alcoholism.

The initiator of cardiopulmonary resuscitation (CPR) (Table 2) was most often the paramedics (63.1%), followed in order of frequency by the public (19.7%), emergency medical technician (13.6%), nurse at arrest site (2.6%), and physician at arrest site (0.97%). The three groups were similar (NS) in regard to the initiator of CPR.

The initial rhythm identified by the paramedics (Table 2) was ventricular fibrillation/ventricular tachycardia in 57%, a bradyarrhythmia 23.9%, other (e.g., pulseless idioventricular rhythm) 6.1% and was unknown in 12.9%. A statistically significant difference was shown between the EOA and ET groups when the initial rhythm was labeled "other" or "unknown," otherwise the three groups were similar in regard to initial rhythm.

The causes of arrest are summarized in Table 2. There are no statistically significant differences among groups in regard to any of the causes of arrest. This table also includes those patients who were reported by the paramedics to have vomited. The vomiting occurred prior to establishing an airway and possibly contributed to the patient's arrest (e.g., aspiration). The frequency of preintubation vomiting was significantly ($P<.025$) higher in the ET group compared to the EOA group.

Arterial Blood Gases

ABGs (Table 3) were analyzed only in patients whose blood gases were documented to have been drawn with the arriving airway(s) in place. There is no statistically significant difference in any of the blood gas parameters between any of the groups.

The ABGs for the three groups were also examined according to survival. Within each subgroup the blood gas parameters were similar (NS) for patients receiving the ET, EOA, or both airways. The difference in the mean $Pa0_2$ between the EOA and ET survivors was deceptive because 3 of the 9 patients (33.3%) with ET intubation had a $Pa0_2$ of greater than 275, while only 1 of the 22 patients (4.5%) with an EOA had $Pa0_2$ of greater than 275.

Hospital Course

Table 4 lists the incidence of neurological

TABLE 1
Population Characteristics

	Total		*EOA*		*ET*		*BA**	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Age (mean years)	62.1		61.9		62.0		63.4	
Sex: Male	230	74.9	150	76.5	52	66.7	28	84.8
Female	77	25.1	46	23.5	26	53.3	5	15.2
Past Medical History								
No cardiac history	56	18.1	33	16.8	17	21.5	6	18.2
Unknown cardiac history	117	37.9	75	38.1	31	39.2	11	33.3
Past cardiac history:**	136	44.0	89	45.2	31	39.2	16	48.5
CHF only	18	5.8	13	6.6	4	5.1	1	3.0
CHF & MI	8	2.6	5	2.5	2	2.5	1	3.0
CHF & HTN	5	1.6	2	1.0	3	3.8	0	0.0
CHF & MI & HTN	7	2.3	4	2.0	2	2.5	1	3.0
HTN only	27	8.7	17	8.6	5	6.3	5	15.2
HTN & MI	5	1.6	2	1.0	1	1.3	2	6.1
MI only	49	15.9	38	19.3	8	10.1	3	9.1
Cardiac history +	10	3.2	5	2.5	3	3.8	2	6.1
Other cardiac history + +	7	2.3	3	1.5	3	3.8	1	3.0
TOTAL:	309		197		79		33	
Non-cardiac problems								
Alcoholism	24	7.8	12	6.1	11	13.9	1	3.0
Diabetes Mellitus	21	6.8	15	7.6	3	3.8	3	9.1
Chronic obstructive pulmonary disease	21	6.8	14	7.1	6	7.6	1	3.0
TOTAL:	66	21.4	41	20.8	20	25.3	5	15.2

*Both airway
**Cardiac problems: CHF indicates Congestive Heart Failure; MI, Myocardial Infarction; HTN, Hypertension
+Positive cardiac history - unknown specific type
+ +Includes angina, syncope, pacemaker, coronary artery bypass surgery, etc.

TABLE 2
Population Characteristics

	Combined		*EOA*		*ET*		*BA**	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
Initiator of CPR								
Paramedic	195	63.1	129	65.5	49	62.0	17	51.5
Public	61	19.7	40	20.3	15	19.0	6	18.2
Emergency Medical Technician	42	13.6	21	10.7	13	16.5	8	24.2
Registered Nurse	8	2.6	5	2.5	2	2.5	1	3.0
Physician	3	0.97	2	1.0	0	0	1	3.0
TOTAL	309		197		79		33	
Initial Rhythm								
Ventricular tachycardia/ ventricular fibrillation	176	57.0	109	55.3	43	54.4	24	72.7
Bradycardias, blocks, aystole	74	23.9	46	23.4	23	29.1	5	15.2
Other, pulseless idioventricular rhythm	19	6.1	7	3.6†		11.4	3	9.1
Unknown	40	12.9	35	17.8††	4	5.1	1	3.0
TOTAL	309		197		79		33	
Cause of Arrest								
Acute myocardial infarction	54	17.5	38	19.3	11	13.9	5	15.2
Primary arrhythmia	51	16.5	33	16.8	12	15.2	6	18.2
Respiratory arrest	29	9.4	17	8.6	9	11.4	3	9.1
Other	9	2.9	3	1.5	4	5.1	2	6.1
Unknown	166	53.7	106	53.8	43	54.4	17	51.5
TOTAL	309		197		79		33	
Preintubation Vomiting	44	14.2	19	10.2†††	17	21.5	7	21.2

* Both airways
† P <.05 ET vs EOA
†† P <.02 ET vs EOA
†††P <.025 ET vs EOA

TABLE 3

Initial Arterial Blood Gases

	N	*Airway*	*Mean* PaO_2 (mmHg)	*Range* PaO_2 (mmHg)	*Mean* (mmHg)	*Mean* pH
Total	64	EOA	85.5	4-457	51	7.23
	35	ET	132.6	12-563	44.8	7.22
	13	BA*	62.6	8-205	58.9	7.20
Survivors	22	EOA	95.3	45-399	34.8	7.33
	9	ET	194.7	45-563	33.6	7.29
	0	BA	—	—	—	—
Hospital Deaths	22	EOA	118.6	8-457	41.8	7.23
	18	ET	132.5	18-427	44.3	7.27
	9	BA	83.4	40-205	45.6	7.28
ER Deaths	20	EOA	38.4	4-137	79.1	7.07
	8	ET	62.8	12-286	58.4	7.13
	4	BA	15.8	8-32	88.8	7.01

*Both Airways

TABLE 4

Hospital course of patients surviving prehospital cardiac arrest

	Total		*EOA*		*ET*		*BA**	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*
# Patients surviving to hospitalization	95		57		28		10	
Neurological Sequelae:								
None	9	9.5	6	10.5	3	10.7	0	0
Unknown	19	20.0	9	15.8	5	17.9	5**	50.0
Total Documented Events	67	70.5	42	73.7	20	71.4	5	50.0
Brain Death	36	37.9	21	36.8	10	35.7	5	50.0
With residual***	18	18.9	13	22.8	5	17.9	0	0
Without residual	13	13.7	8	14.0	5	17.9	0	0
Aspiration Pneumonia	25	26.3	13	22.8	8	28.6	4	40.0
Congestive Heart Failure	42	44.2	24	42.1	14	50.0	4	40.0
Time to Extubation								
Mean (days)	5.1		5.1		4		8.3	
Range (days)	.33-19		.33-19		2-17		7-10	

* Both Airways

** $P < .05$ EOA vs BA

***Excludes patients with brain death

sequelae, aspiration pneumonia, congestive heart failure (CHF), and the average time to extubation in hospitalized patients. Neurological sequelae were considered to be neurological events that could be attributed to the initial arrest and did not include neurological events due to a second event in the hospital. A documented neurological event occurred in 70.5% (67/95) of the hospitalized patients. There were no statistically significant differences among the three groups for total neurological events or for the subgroups of brain death, neurological sequelae with residual, and neurological sequelae without residual. The percent of patients who had no neurological event was similar (NS) in the three groups. Aspiration pneumonia occurred in 26.3% (25/95) of the hospitalized patients. There was no statistically significant difference between the three groups of hospitalized patients with regard to the incidence of CHF or aspiration pneumonia. The average time to extubation was 5.1 days. The average number of days to extubation was similar (NS) for the three groups.

Survival

Table 5 shows survival by airway group. Of the 197 EOA patients, 27 (13.7%) survived to be discharged. Of the 79 ET patients, 10 (12.7%) survived to be discharged. There was no statistically significant difference between these two groups in survival. No patient who received both airways survived to discharge. When survival to discharge was compared between the BA group and the EOA group, a significantly higher ($P < .05$) survival was found in the EOA group. There was no statistically significant difference in survival to discharge between the ET and BA groups ($P > .05$). There was no significant difference among the groups in survival to ER or in survival to admission. Table 6 shows survival according to initial rhythm. Patients whose initial rhythm was ventricular tachycardia or ventricular fibrillation had the highest rate of survival while patients with bradyarrhythmias the lowest.

Complications and Difficulties

Airway complications on insertion (Table 7) occurred in 7.1% of the patients receiving an ET and in only 2.2% of the patients receiving the EOA (NS). Autopsy results in 35 patients with EOA attempts showed three (8.5%) with esophageal lacerations. While 19.4% of the ET attempts were unsuccessful, only 1.7% of the EOA attempts were unsuccessful ($P < .0001$).

Discussion

Effective ventilation is crucial for successful outcome in patients with a cardiopulmonary arrest. At present, the ET is the optimal airway for respiratory management in an apneic patient. However, the placement of an ET tube requires a certain level of skill, the use of a laryngoscope, and frequent use or retraining to maintain proficiency. Because of the difficulty with learning and maintaining ET intubation skills, alternative methods for ventilation were developed. In 1968, Don Michael described a device that obstructed the esophagus and simultaneously allowed ventilation of the lungs.[10] This device, with modifications, is now known as the esophageal obturator airway. Since its introduction, the EOA has been used in approximately 2 million cardiopulmonary arrests.[8]

The advantages of the EOA over the ET have been stated to be the relative ease and speed of insertion, shorter time required for training and skill maintenance, lack of need for a laryngoscope, and its safer insertion in patients with cervical trauma.[7,8,11-13] In addition, we have found the training is less costly for the EOA. In communities where resources for training are limited, the EOA would be an attractive alternative for short-term prehospital airway management if documentation regarding its efficacy could be shown.

TABLE 5

Survival by airway

Airway	*Total* *N*	*Survival to ER* *N*	%	*Survival to Admission* *N*	%	*Survival to Discharge* *N*	%
Total	309	201	65.0	95	30.7	37	12.0
EOA	197	129	65.5	57	28.9	27	13.7
ET	79	51	64.6	28	35.4	10	12.7
BA*	33	21	63.6	10	30.3	0	0**

* Both Airways

**P<.05 EOA vs BA

At present, controversy exists about the EOA's efficacy when compared to the ET. Essentially equivalent tidal volumes with EOA and ET ventilation have been shown in some studies[13,14] but not confirmed in others.[15,16] In addition, some authors have reported comparable oxygenation with the EOA and ET[5,6,7,13] while others have not.[3,4] Ventilation, assessed by $PaCO_2$ measurements, has been reported to be similar in patients ventilated with the ET and EOA by Hammargren, et al.,[6] while data from others show a significantly higher $PaCO_2$ in patients ventilated with the EOA.[3,4,7]

The differences in results reported by the above authors can best be explained by different patient populations, timing of ABG measurements, and the skill of the person ventilating. When oxygenation was reported to be inferior with the EOA,[3,4] the ABGs with the EOA were drawn immediately after ER arrival, while ABGs with the ET were drawn after a period of ER stabilization. This is hardly a fair comparison. When oxygenation with the EOA was reported to be equivalent to the ET,[5,6,7] the ABGs were drawn after a period of ER stabilization with each tube. This, however, may not reflect true field conditions.

Because of results reported by some authors[4] showing the ET to be superior to the EOA in the prehospital cardiac arrest patient, Mattox[4] has stated that the EOA, "remains a gadget in search of an indication," and has raised the question of whether the FDA should recall "this potentially dangerous instrument." In communities where resources for ET training are not available, if the EOA were recalled, the only alternative would be

TABLE 6

Survival to hospital discharge by initial rhythm

Initial Rhythm+	*Combined* *N*	*S++*	*%S*	*EOA* *N*	*S*	*%S*	*ET* *N*	*S*	*%S*	*BA** *N*	*S*	*%S*
VTach/VFib	176	29	16.5	109	21	19.3	43	8	18.6	24	0**	0
Brady	74	2	2.7	46	2	4.3	23	0	0	5	0	0
Other	19	3	15.8	7	1	14.3	9	2	22.2	3	0	0
Unknown	40	3	7.5	35	3	8.6	4	0	0	1	0	0
TOTAL	309	37	12	197	27**	13.7	79	10	12.7	33	0	0

* Both Airways

** P<.05 EOA vs BA; + Initial Rhythm: VTach/VFib indicates ventricular tachycardia/ventricular fibrillation; Brady indicates Bradyarrhythmias (bradycardia, blocks, asystole); S++ Survival

TABLE 7
Complications of airway insertion

	EOA	*ET*
# inserted	230*	112*
# complications	5 (2.2%)	8 (7.1%)
Malposition:		
Mainstem bronchus		4
Esophagus		2
Curled in mouth	1	
Balloon Leakage	4	2

*Includes 33 patients who received both airways

the oral airway. While oxygenation and ventilation data are one way to evaluate the EOA's efficacy, a better way to evaluate a therapeutic modality's influence in a cardiopulmonary arrest is its effect on patient outcome — morbidity and mortality.

To evaluate the efficacy of the EOA, this study compared the morbidity and mortality in similar prehospital cardiopulmonary arrest patients ventilated by the ET and/or EOA. Our data show that when the EOA is used in out-of-hospital cardiopulmonary arrest, patients have similar (NS) survival rates, incidence of CHF, and neurological sequelae as a comparable group of patients receiving an ET. Interestingly, no patient in the BA group survived. Possible explanations include prolonged apnea times either secondary to difficult intubation(s), or time wasted intubating the patients with both airways (e.g., the EOA first to prevent regurgitation followed by the ET).

Our study shows a significantly higher incidence of unsuccessful intubation attempts with the ET compared to the EOA ($P < .0001$). This increased incidence of unsuccessful intubation attempts may have prolonged the apnea time in the ET group. Don Michael and Gordon[13] also found more difficulty with ET than EOA intubation. These authors had house staff fully trained in both EOA and ET intubation intubate 50 patients who had failed to be resuscitated. Each patient was intubated with an EOA and ET by the house staff. Esophageal airway intubations were achieved in 90% of the patients on the first attempt in an average time of 5 seconds (maximum time 20 seconds) while only half of the ET intubations were successful on the first attempt with an average time of 20 seconds (maximum time 68 seconds). To our knowledge, no other author has evaluated the success of both airways in comparable patients.

We do not know all the reasons why some patients had both airways. Patients who had both airways placed received the EOA prior to the ET. In the majority of the cases, the reason cited for both airways being placed was that ET placement was easier post-EOA placement.

The incidence of esophageal lacerations in our autopsied patients was 8.5%. While many instances of esophageal trauma have been reported,[17-22] the true incidence of esophageal injury is unknown, as most patients do not undergo endoscopic evaluation or autopsies. Strate and Fischer[19] reported four cases of esophageal injury in a series of 200 esophageal airway intubations. This is similar to our three incidences in 213 insertions. Donen et al.[22] reported a 10% incidence of esophageal damage in their autopsied patients. This is similar to the 8.5% incidence in our autopsied patients. Some authors[8] have suggested that the esophageal gastric tube airway may cause less esophageal damage. A prospective evaluation is needed to determine the incidence of esophageal trauma.

Although our data suggest that the EOA is comparable to the ET in the prehospital setting, caution must be used when interpreting our results. Because our study was a retrospective study, it has all the inherent problems that retrospective studies possess. Specifically, there were problems with data retrieval. Many charts had poor documentation and incomplete data. For example, the FiO_2s and the timing of many of the ABGs were difficult to determine. The patients in this study were not randomized. Comparison of non-randomized groups invariably introduces bias. While population characteristics were comparable among the three groups analyzed, there were some differences. Most notable were the differences in the frequency of pre-intubation vomiting and the differences in initial rhythm identified in the EOA and ET groups. Also, since only some of the paramedics were trained in ET intubation, the resuscitation efforts by these paramedics may have been somewhat different from the others. Since they volunteered for extra training, the paramedics trained in ET intubation may have been more aggressive, and may have paid more attention to airway management. In addition, we cannot exclude the possibility that our failure to find a significant difference in morbidity or mortality between the EOA and ET groups may be due to the sample size.

In defense of our data, most population characteristics were similar among the three groups. Also, the survival by initial rhythm in our patients was similar to those previously reported.[23,24]

Summary

In summary, this retrospective study comparing the EOA and ET in similar patients showed no difference in either mortality, neurological sequelae, or incidence of CHF between the EOA and ET groups. When the EOA group was compared to the BA group, there was a significantly higher rate of survival in the EOA group. The incidence of unsuccessful intubation attempts was higher with the ET than the EOA ($P < .0001$). Thus, while the ET is the definitive adjunct for airway management in a cardiopulmonary arrest, our data suggest that the EOA is a satisfactory alternative for short-term use in the prehospital setting.

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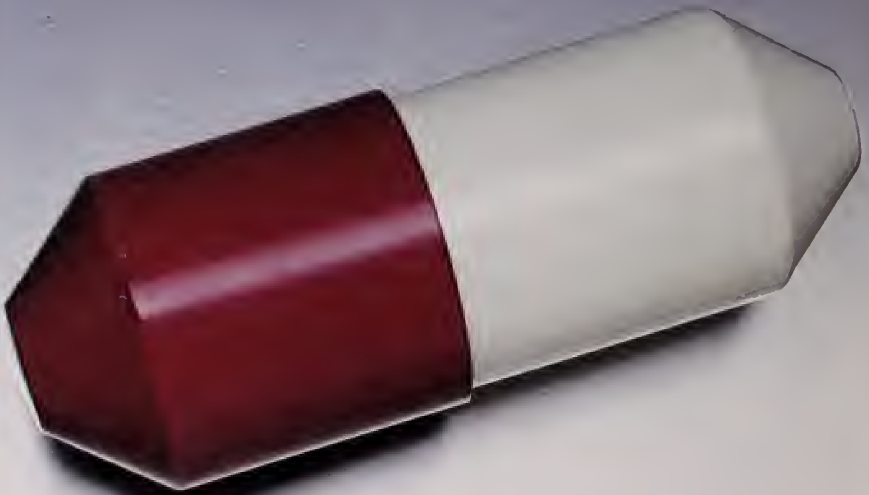

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Intrapleural Tetracycline in the Treatment of Malignant Pleural Effusions*

THOMAS BEATTY DUNKEL, M.D.[†]

The rate of recurrence in 60 consecutive patients with malignant or pleural fluid treated with intrapleural tetracycline was studied. Only 7 patients required retreatment. Twenty-eight patients developed recurrent effusions during the course of their illness. Intrapleural lidocaine given with the tetracycline did not produce a significant decrease in the pain of tetracycline instillation. Our results indicate excellent control of malignant pleural effusions with the use of tube drainage and intrapleural tetracycline. The response is temporary, however, and as the underlying malignancy progresses, the rate of recurrence increases.

Malignancy is a common cause of pleural effusion, with 30-50% of all effusions occurring as a result of cancer. Breast, lung, and lymphoid cancers are the most common site of origin, with ovarian, genitourinary, and gastrointestinal malignancies less common causes.[1]

In patients with malignancy, pleural effusion is a common problem. It was seen in 48% of 601 breast cancer patients in one series[2] and 33% of 101,070 postmortem lung cancer patients[3] in another. Lymphomas show effusions in 16-27% for Hodgkins and 20-33% in non-Hodgkins lymphomas.[1]

Pleural effusions develop when the normal flow/absorption system is disrupted. Five to ten liters of fluid pass through the pleural space in normal persons each day.[4] As a result of the differences in the hydrostatic pressures of the parietal and visceral pleura, the fluid moves to the visceral pleura and is absorbed there. Proteins enter the circulation through the lymphatic system. If hydrostatic pressure, colloid osmotic pressure, capillary permeability, or lymphatic drainage are altered, pleural effusions can develop. Increased capillary permeability and obstructed pleural lymphatics are common causes of effusion in malignancy disease. Free growth of tumor cells in pleural space can also cause effusion to develop.[1]

The diagnosis of pleural malignancy is established by removal of fluid for cytologic evaluation. Often, a pleural biopsy is obtained at the same time. Much of the fluid may be removed at the time of these procedures.

Systemic therapy for the underlying malignancy is the primary treatment of many effusions. When systemic therapy does not control the effusion, pain and respiratory distress may result. In these cases, local therapy is selected. A wide variety of local therapies has been tried with variable results. Tube drainage alone gave 50% treatment success (Izbickir et al.[5]). Other forms of treatment included intrapleural radioisotopes and nitrogen mustard. Patients treated with a combination of pluritis-inducing drugs plus tube drainage had a better response than either treatment alone.

Both intrapleural quinacrine and talc have given good response rates without the bone marrow suppression noted in nitrogen mustard or bleomycin therapy.[9,10] The significant morbidity and length of treatment (four to five days) make quinacrine treatment less than ideal. Talc is an effective treatment with low morbidity if given through a chest tube,[11] although the mechanisms of the administration are somewhat cumbersome. Pleurectomy gives nearly 100% cure, but its high morbidity and a 10% mortality rate make this a very selective procedure.[7,8]

Biopsy studies after intrapleural treatment have shown an intense fibrotic reaction occurring on the two pleural surfaces with the development of synthesis even in the presence of tumor cells.[6]

In 1972, Rubinson and Bolooki[12] reported that 500 mg of tetracycline diluted in 30 mg of saline injected into the intrapleural space after all the fluid had been removed gave a therapeutic response in 10 of 12 (83.3%) patients with malignancy effusions. Wallach[13] noted no recurrence at 30 days in 7 of 7 patients, and only 1 of 7 had effusions at autopsy. Grady had only 6 failures in 108 procedures, and 49% were symptom-free at three months.

Sahn, Good, and Potts[14] gave rabbits tetracycline buffered to maintain a pH of 2 even with dilution. They were able to produce more sclerosis with this treatment than in agents with a higher pH.

One of the major drawbacks to intrapleural tetracycline is pain and fever.[12,13] Fox[17] and Harbecke[18] noted in letters to the editor, *JAMA*, that lidocaine instilled into the pleural space decreased the amount of pain.

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* Supported in part by grant #349-84 Park Nicollet Medical Foundation

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TABLE 1

Primary site of the malignancies in patients with malignant effusions

Breast	23
Lung	14
Lymphoma	7
Colon	7
Ovary	3
Prostate	2
Gastric	1
Esphagus	1
Kidney	1
Liver	1
Uterus	1
Unknown	3

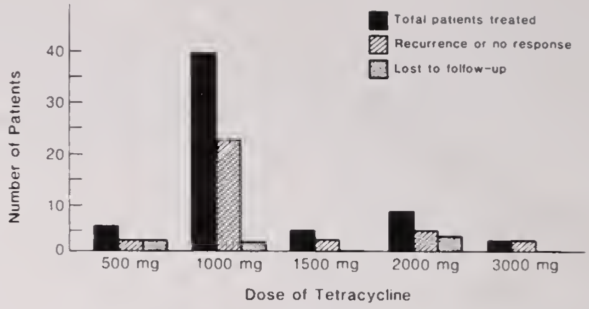

Figure 1 - Number of patients and response to treatment in patients receiving various doses of tetracycline.

Materials and Methods

Sixty consecutive patients who received 67 intrapleural tetracycline treatments from 1978 through 1983 were studied retrospectively. Hospital records, clinic records, tumor registry data, and X-ray and postmortem reports were reviewed. There were 23 patients with breast cancer, 14 patients with lung cancer, and 23 patients with a variety of other tumors (Table 1). There were 29 females and 21 males. Five patients were lost to follow-up, 46 were followed until they expired, and 9 are known to be living. The average age was 62 with a range from 25 to 93.

All patients had drainage of the pleural space prior to tetracycline instillation, with drainage for 24 hours after insertion of a chest tube. Sixty-seven treatments were completed, with 7 patients receiving a second treatment. The most common dose was 1000 mg of tetracycline—39 patients received this dose (Figure 1). Six patients received 500 mg, 5 patients received 1500 mg, 8 patients received 2000 mg, and 2 patients received 3000 mg. Thirty-four patients received a total of 38 instillations of intrapleural lidocaine prior to the instillation of tetracycline. The chest tube was left to suction until drainage diminished, and the chest tube was then withdrawn.

Recurrence was regarded as any evidence of effusion on chest X-ray or postmortem examination or if mentioned in any physician notes. The time of the recurrence was noted as the time when the effusion was first noted in the medical record.

Complications reviewed were fever, pulmonary infiltrates, persistent pain, infection, hemoptysis, pneumothorax, and other. The pain was graded as follows: no pain, moderate pain (pain controlled with analgesics), and severe pain (pain requiring additional analgesics after the first dose, or not controlled with analgesics).

Results

Of the 60 patients receiving treatment and available for analysis, only 7 (11%) required retreatment (Table 2). Twenty-three patients had no evidence of recurrence. Twenty-eight patients developed recurrent effusions during the course of their illness (Figure 2).

Figure 2 shows the time sequence of that recurrence compared to the accumulative mortality of the group as a whole. Of the 7 patients who required retreatment, 1 required it at three weeks, 3 required it at one month, 1 required it at five weeks, and 2 required it at 17 weeks. All but one of those retreated had recurrence of their effusions after the second course of therapy.

TABLE 2

Number of patients who require retreatment compared to those not requiring retreatment, by tumor type

	Retreatment	*#Patients with Disease*	*%*
Breast	3	23	13
Lymphoma	3	7	43
Ovarian	1	3	33

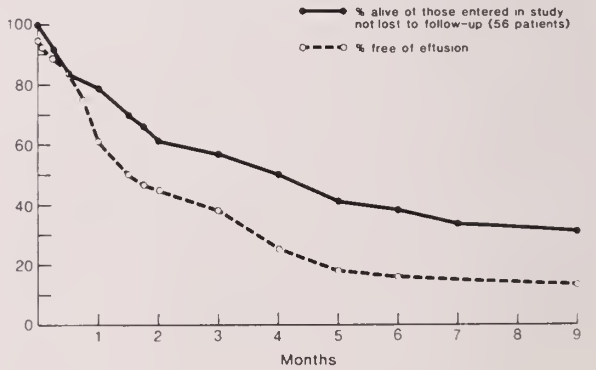

Figure 2 - Rate of recurrence of malignant effusions compared with survival over time.

With these recurrent effusions, 3 patients had breast cancer, 3 had lymphomas, and 1 was ovarian in origin.

Of the 40 patients who received 1000 mg of tetracycline, 22 had recurrence sometime during the course of their illness, and 1 was lost to follow-up. Of the 7 patients who required retreatment, 5 had been treated with 1000 mg of tetracycline. Of the 6 patients who received 500 mg of tetracycline, 1 was lost to follow-up, 4 had no recurrence at the time of their death, and 1 (lymphosarcoma) was retreated at three weeks. Of the 8 patients who received 2000 mg of tetracycline, 3 were lost to follow-up, 1 had no response, 1 had recurrence at three weeks, 1 at one month, 1 at four months, and 1 at five months. The 2 patients who received 3000 mg had recurrence at one and four months respectively (Table 3).

Complications encountered were pain in 33 patients, fever in 4, and pulmonary infiltrates in 2.

Twenty-two of 67 treatments (32.8%) had severe pain as a complication. Of the 38 patients treated with intrapleural lidocaine, 11 had severe pain (28.9%), and of the 29 patients not treated with lidocaine, 11 (37.9%) had severe pain. Of the 39 treatments where 1000 mg of tetracycline was used, 14 (35.9%) had severe pain. Of those 28 patients where lidocaine was used to oblate pain, 8 (28.6%) had severe pain, while in 11 of the patients who did not receive lidocaine, 6 (54.5%) had severe pain (Figure 3) (not significant).

Discussion

This study of consecutive malignant effusions treated with tetracycline demonstrated an excellent initial response to treatment. As the underlying malignancy progressed, however, there was often a recurrence of the effusion.

The mortality curve reflects, with some delay, the recurrence curve. The observation that the recurrence of effusion paralleled the progression of the disease is suggested by the finding that only 7 patients were selected for retreatment, and all of those 7 had eventual recurrence of their malignant effusions. There was no difference in the recurrence rate between breast cancer or lung cancer, the only groups with a large enough sample for comparison.

Comparison of recurrence rates between previous studies depends on the methods of study. Grady et al.[16] noted a 94.4% success rate in 108 procedures but used recurrence of symptoms as their indicator. Zaloznik[21] studied his patients prospectively with chest X-rays taken every two weeks for two months and monthly thereafter, and 69% had a complete response at six weeks to 34 months — after excluding 11 of 30 patients who expired at one month. Lees and Hay[19] noted an increased recurrence rate with time, with 29 of 50 patients with breast cancer developing recurrent effusions at six months, with development of symptoms the indication of recurrence.

TABLE 3

Number of patients without recurrence of effusion compared to total number of patients with that primary cancer.

	No Recurrence of Effusion		*%*
Breast	10/23		43
Lung	5/13		38
Other	7/20		35
		1 Lost	4
Total	22/56		39

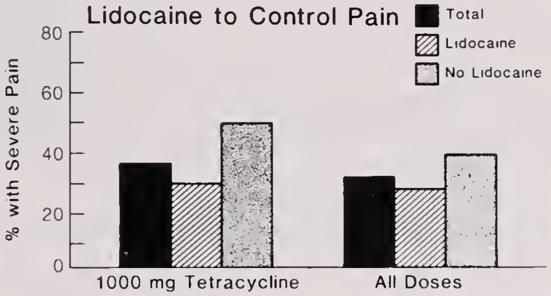

Figure 3 - Incidence of severe pain with treatment of malignant effusion using 1000 mg of tetracycline and all doses of tetracycline with or without intrapleural lidocaine prior to tetracycline instillation.

Our studies reaffirm the observation that as the disease progresses, recurrence of effusion can occur, and that symptoms are the major determinant in the decision to retreat.

Severe pain associated with the instillation of the tetracycline has been a major problem with this form of treatment. Observations to date on the efficacy of intrapleural tetracycline have been anecdotal. This study demonstrated no significant decrease in the extent of the pain. There was some suggestion that lidocaine instilled with the tetracycline decreased the intensity of the pain, but the response was variable. A prospective study under more controlled conditions is indicated.

Conclusions

Excellent control of malignant effusions can be achieved with tube drainage followed by intrapleural tetracycline. This control is often temporary, however, as the underlying malignancy progresses. Intrapleural lidocaine used along with the tetracycline did not significantly reduce the severe pain seen with this procedure.

References to page 725.

Cholestatic Jaundice Associated With Methyldopa

K. VENKATESWARA RAO, M.D., FACP*

Clinical and biochemical abnormalities consistent with cholestatic jaundice developed in a 40-year-old man following the administration of methyldopa. The abnormal clinical symptoms and the elevated serum bilirubin level remitted promptly after discontinuation of methyldopa. Our experience with this patient along with two other cases reported in the literature suggest that cholestatic jaundice should be recognized as a complication of methyldopa therapy.

Jaudice resulting from hepatocellular disease is a known complication in patients receiving methyldopa (Aldomet^R).[1-4] But cholestatic jaundice is an uncommon complication. To my knowledge, only two such cases have been described previously.[4-5] Herein I report another patient who developed cholestatic jaundice after receiving methyldopa.

Case Report

A 40-year-old black male was admitted to Hennepin County Medical Center with symptoms of frontal headache, intermittent blurring of vision, and epistaxis. History revealed that the patient was unemployed and had been consuming about a pint of whiskey a day for the past 20 years. He had no known medical or surgical illnesses. His father died at age 55 with hypertension and intracerebral hemorrhage. The pertinent findings on physical examination were exogenous obesity and blood pressure of 215/140 mmHg. He had grade III hypertensive retinopathy. The liver span was 13 cm by percussion in the mid axillary line. His mental status was clear. There was no evidence of jaundice, pedal edema, or ascites. Results of the liver function tests done during this hospitalization were as follows: serum glutamic oxalacetic transaminase (SGOT), 62 karmen units (N10-45); serum alkaline phosphatase, 28 King Armstrong units (N4-17) and serum bilirubin, 0.7 mg/dl (N $<$ 1.0 mg/dl).

The patient was treated with methyldopa 250 mg/qid and hydralazine 25 mg/qid. Following this treatment his blood pressure had decreased to 130/90 mmHg. He was discharged from the hospital and subsequently seen in the clinic two weeks later. Because his blood pressure was well controlled (120/74 mmHg), methyldopa was discontinued, and the patient was advised to take hydralazine alone. The patient did not comply with the medical treatment and was lost for follow-up for four months. At this time his blood pressure had increased to 190/120 mmHg, but he had no acute clinical symptoms. The liver function tests showed SGOT of 72 KU, alkaline phosphatase of 34 KAU, and bilirubin of 2.0 mg/dl. Therapy was reinstated with methyldopa 250 mg tid and hydrochlorothiazide 50 mg/day.

He was seen in the clinic three months later, at which time he appeared acutely ill and complained of anorexia, nausea, pruritus, yellowish discoloration of urine, and sexual impotence. According to the patient, these symptoms had become worse during the preceding four weeks. He denied abdominal pain, or exposure to chemicals or to anyone with hepatitis. He had not taken any other drugs except methyldopa and hydrochlorothiazide. Physical examination revealed intense scleral icterus, hepatomegaly (liver span 17 cm by percussion), poor skin turgor, and postural hypotension (supine blood pressure, 130/70 mm; standing 90/60 mm). Pertinent laboratory data were: Hematocrit 38%, reticulocyte count 0.5%, Coomb's test negative. Prothrombin time 12.3 sec. Serum albumin 3.8 gm/dl. Serological tests for hepatitis B and antinuclear antibodies were negative. Serum complement levels were normal: SGOT was 60 KU; alkaline phosphatase, 61 KAU; serum 5′ nulceotidase, 32.4 microunits/ml (N2-17); and serum bilirubin level, 17.5 mg/dl.

Because of obvious jaundice and signs of dehydration both methyldopa and hydrochlorothiazide were discontinued. A week later, the nausea and pruritus had disappeared, and the patient's appetite improved. The serum bilirubin had declined steadily to 8.4 mg/dl at one week, 5.4 mg/dl at two weeks, and 1.0 mg/dl at eight weeks after the discontinuation of methyldopa. The patient's hypertension was subsequently controlled with a combination of hydrochlorothiazide, hydralazine, and propranolol. Despite the patient's continued ingestion of alcohol, his serum bilirubin levels remained between 1.0 mg and 1.5 mg/dl over the next 12 months. The temporal relation between the administration of methyldopa and the level of serum bilirubin is shown diagramatically in the Figure.

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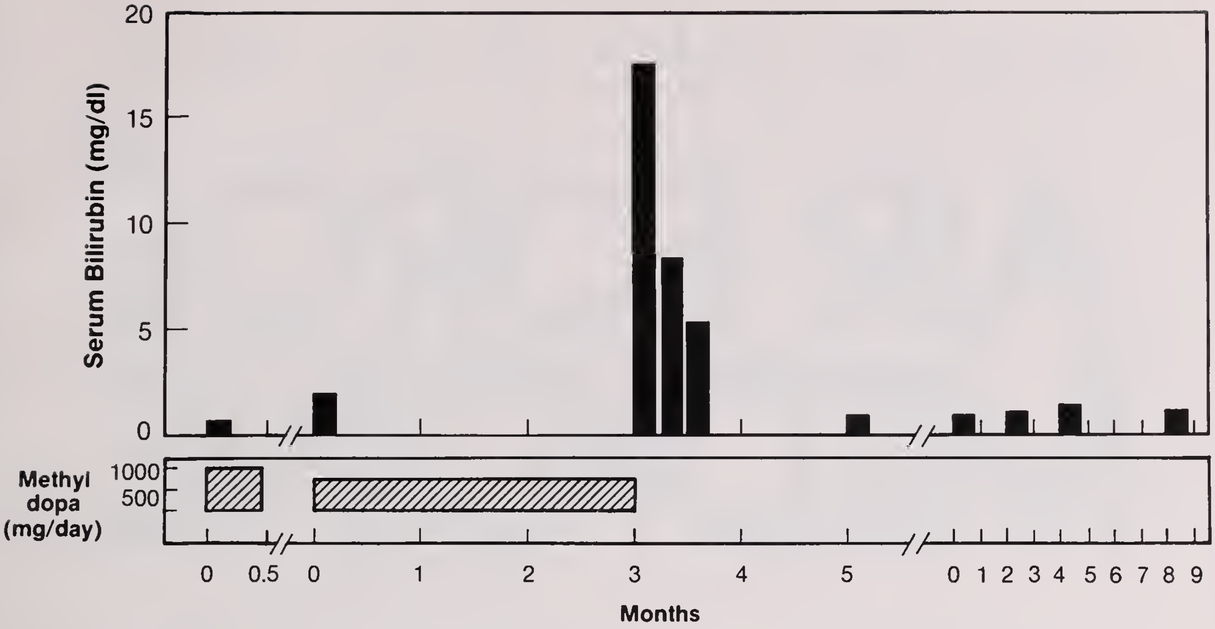

Figure - The temporal relation between the level of serum bilirubin and treatment with methyldopa. Note prompt decline in the level of serum bilirubin following discontinuation of methyldopa.

Comment

Clinical and biochemical abnormalities consistent with cholestasis were observed in our patient approximately two months after the administration of methyldopa. The illness had become progressively worse during the next four weeks. However, when the drug was discontinued, the abnormal clinical symptoms subsided within a week. The serum bilirubin had decreased to normal by the end of eight weeks. To avoid the risk of death,[2] albeit remote, we elected not to challenge this patient with another course of methyldopa. Other causes of jaundice, such as hemolytic anemia, extra hepatic biliary obstruction, viral hepatitis, and hepatitis from other drugs, were considered but were not evident on the basis of the history, biochemical and serological data, and subsequent clinical course. Despite the patient's continued ingestion of alcohol and the administration of other anti-hypertensive drugs (with the exception of methyldopa), his serum bilirubin level and other liver function tests have remained stable for a period of twelve months. The jaundice was mild during the patient's initial exposure to methyldopa but became severe following the second exposure, probably due to the longer duration of therapy.

In 1974, Toghill et al.[4] and Hoffbrand et al.[5] described two other patients who developed cholestatic jaundice following methyldopa treatment. Because this association was not recognized, exploratory laparotomy and an open liver biopsy was performed in both patients. The authors proposed that hypersenstivity to the drug was responsible for the intrahepatic cholestasis. An alternative explanation in our patient's case might be that of decreased drug metabolism and further impairment in biliary secretion by the diseased hepatocytes. Because many other antihypertensive drugs are currently available, an alternate drug should be considered in the treatment of hypertension in patients with a history of chronic alcoholism or preexisting hepatic disease.

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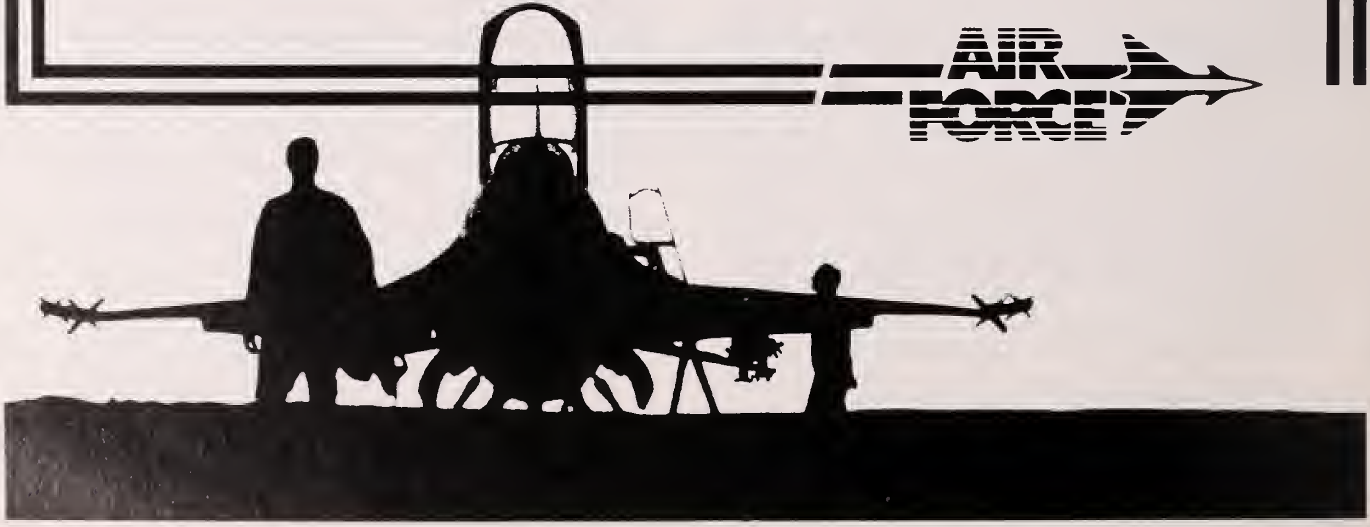

Orange Ceramicware Containing Uranium Glaze

A Source of Avoidable Radiation Exposure

STEVEN SIRR, M.D., M.S.*, FREDRICK GRAMITH, M.D.*, KURT SCHEURER, M.D.*, WARREN STANCHFIELD, M.D.*, JOSEPH GIGANTI, PH.D.*

During the past several decades, investigators have used film badges, Geiger-Mueller (G-M) survey meters, and autoradiographic techniques to measure radiation emitted from brightly colored radioactive ceramic tableware containing uranium glazes. Because radioactive orange glazed ceramicware can be easily obtained and used by the public, we attempted to reassess potential health hazards by evaluating the ceramicware with three techniques. We used a Geiger-Mueller survey meter and steel wool surface wipes to measure radiation emitted from 17 orange glazed ceramicware of varying sizes and shapes. A G-M survey meter measured mean surface radiation levels (gamma plus beta) of 8.4 ± 2.1 mR/hr (range 3.0 - 12.0 mR/hr). This correlates well with previously published results. Radiation levels from steel wool used to vigorously scrub radioactive plates showed levels of activity not significantly above background. Finally, using a 9.5 inch diameter orange dinner plate as a source of radiation, we produced a unique radiograph of a human teaching skeletal hand with a metallic fork between the fingers. We agree with the FDA's recommendation that, although the added radiation exposure from uranium-containing glazed tableware is small and radioactive glaze cannot be removed by vigorous scrubbing, radioactive ceramicware products should be restricted to display purposes only.

Colorful ceramic glazes containing uranium have been commonly used for ceramicware for many decades.[1] Radioactive ceramicware may be easily purchased from antique stores or "flea markets." The radioactive glazes, ranging in color from bright orange to yellow, probably contain U^{238} in the trioxide form (UO_3) as it is the only form of uranium that is an orange-colored powder insoluble in water.[1,2]

Several investigators have measured radiation emitted from ceramicware containing uranium glazes. These studies used either film badges taped to the surface of the ceramicware[1,3] or Geiger-Mueller survey meters.[4] The surface dosimetry measurements range from 0.8 mR/hr to 20 mR/hr.

Autoradiography is another method commonly used by the mining industry to determine amounts of radioactivity within rock specimens. Foster used these methods to image uranium-containing ceramicware to produce autoradiographs of two orange dinner plates.[5]

In order to evaluate whether the radioactive glaze may be removable from radioactive ceramicware and become a health hazard by ingestion, we used a scrubbing method to determine the amount of radioactivity that could be removed by reasonable cleaning.

Materials and Methods

Radiation from orange ceramicware was measured by G-M survey meters and steel wool surface wipes and demonstrated by autoradiography.

Radiation from 17 orange ceramicware pieces was measured by a G-M survey meter[1*] placed on the surface of the ceramicware. All measurements were obtained with the beta window open so both beta and gamma radiation were measured jointly.

Removable radiation measurements were obtained from a single orange dinner plate, the bottom of which was vigorously scrubbed with steel wool. Twenty samples of steel wool were obtained after 30 and 60 seconds of scrubbing. The steel wool pads were inserted into a small vial filled with Toluene solution[2*] and then agitated in order to remove any possible radioactive glaze from the steel wool pad. The steel wool was then removed from each vial and the vials were placed in a liquid scintillation counter.[3*] Each vial was counted for a total of 10 minutes. Background measurement of the steel wool was also obtained.

Autoradiology was performed using a 9.5 inch diameter orange ceramic plate that was placed on top of a teaching skeleton hand. A 17 × 14 inch radiographic film cassette[4*] was exposed to radiation emitted from the plate, thereby producing a unique image of the skeleton. Total exposure time was 7 days.

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[1*] Geiger-Mueller survey meter, Model 3, Ludlum Measurements, Inc., Sweetwater, Texas

[2*] Toluene solution (4a20), Research Products International Corp, Elk Grove Village, Illinois

[3*] Minaxi, Tri-carb 4000 series, Packard, Downers Grove, Illinois

[4*] Dupont Cronex 10 Film, Quanta 3, fast detail screen

Results

Geiger-Mueller survey meter results are shown in Table 1. Mean surface radiation levels (gamma plus beta) were 8.4 ± 2.1 mR/hr (range 3.0 - 12.0 mR/hr).

Steel wool wipe results are shown in Table 2. Radiation from steel wool samples after the 30 and 60 second wipes are not significantly above background radiation levels.

The radiograph of the teaching skeleton hand with a metallic fork placed between the fingers is shown in Figure 1. The dark lines around the edges of the plate correspond to edges of the plate, which have greater depth of glaze and therefore more radioactivity. The image haziness is due to the nonparallel nature of emitted radiation from the plate.

Discussion

Low-level radiation or "background" radiation provides a continuous source of exposure on the surface of the earth. Major sources of background radiation responsible for biological exposure include cosmic radiation, radiation derived from uranium decay products such as those found in building materials, and ingested isotopes such as those deposited in bone minerals.[6,7]

Levels of background radiation vary greatly according to location on the earth's surface. The average background radiation of Minnesota is 0.017 mR/hr. However, in certain parts of Brazil and India, background radiation may reach 0.148 mR/hr.[6] Common exposure dose from chest radiographs is about 20 mR.[7] While radiation dosimetry from various sources is difficult to compare, the prudent practice is to avoid exposure that is not necessary. Nuclear medicine and radiological procedures expose patients to radiation in order to gain diagnostic information concerning potential diseases. The radiation exposure involved is usually small but not without potential risk, however slight. There is, however, a very high benefit-to-risk ratio.

Results from this study are in general agreement with previous work; we determined a surface radiation level from orange ceramicware (beta plus gamma) of approximately 10 mR/hr. We found that vigorous scrubbing with steel wool did not remove measurable amounts of radioactivity, and, therefore, possible ingestion of radioactive glaze is minimal.

However, because the surface radiation dose is relatively high, radiation exposure to the hands can be very significant. Assuming a surface radiation level of 10 mR/hr, a daily hand contact of only about 50 min/day would expose hands to about 75 R/yr, which is by law, the maximum allowable hand dose to radiation workers in the United States.

TABLE 1

Geiger-Mueller survery meter readings from surface of orange ceramicware

Type of Ceramicware	*mR/hr (gamma plus beta)*
pepper shaker	3.0
salt shaker	3.5
teapot top	6.5
sugar bowl (4 inch)	10.5
plate (6 inch)	8.0
teapot	12.0
bowl (5 inch)	10.0
butter dish	8.0
bowl (6 inch)	8.0
bowl (6 inch)	10.0
plate (6 inch)	7.0
plate (6 inch)	7.0
plate (7.5 inch)	7.5
plate (10.5 inch)	12.0
plate (13 inch)	12.0
plate (9.5 inch)	10.0
plate (9.5 inch)	8.0

TABLE 2

Results from steel wool wipe testing

	Counts/min	*Range*	*r*
Background	22.7	23.1-23.9	
Steel wool wipes (30 sec)	21.7	19.1-23.0	NS
Steel wool wipes (60 sec)	24.8	19.5-23.2	NS

NS = not significant

Although we believe that the possibility of ingesting radioactive glazes removed from ceramicware by cleaning with steel wool is minimal, the high hand dose reinforces the FDA's recommendations that "The levels of radioactive material in ceramic tableware are not considered hazardous. However, such exposures are clearly avoidable and of no benefit to the public. Therefore, the use of such products should be avoided as unnecessary exposure to radioactive materials."

Acknowledgments

The authors wish to thank Deanna Gunderson and Jennifer Prescia for their fine secretarial service and Katie Trotzky for editorial services.

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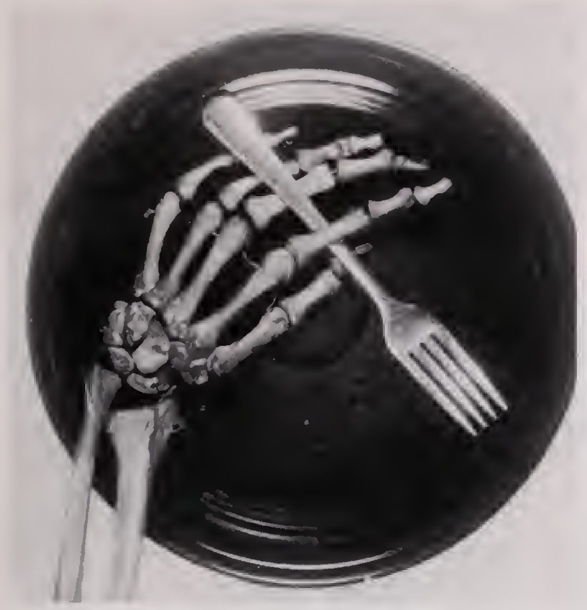

Figure 1A - Photograph of teaching skeletal hand on orange glazed ceramicware.

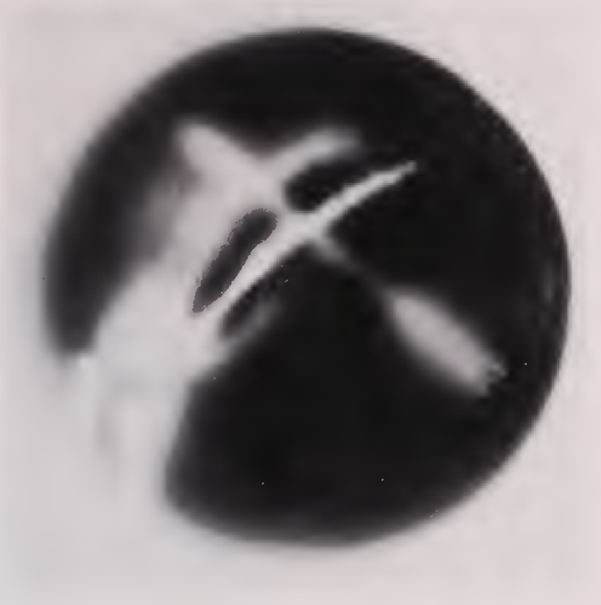

Figure 1B - Radiograph of skeletal hand produced by exposing X-ray film to radiation emitted from the radioactive plate for 7 days.

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Intrapleural Tetracycline-Dunkel (continued from page 719)

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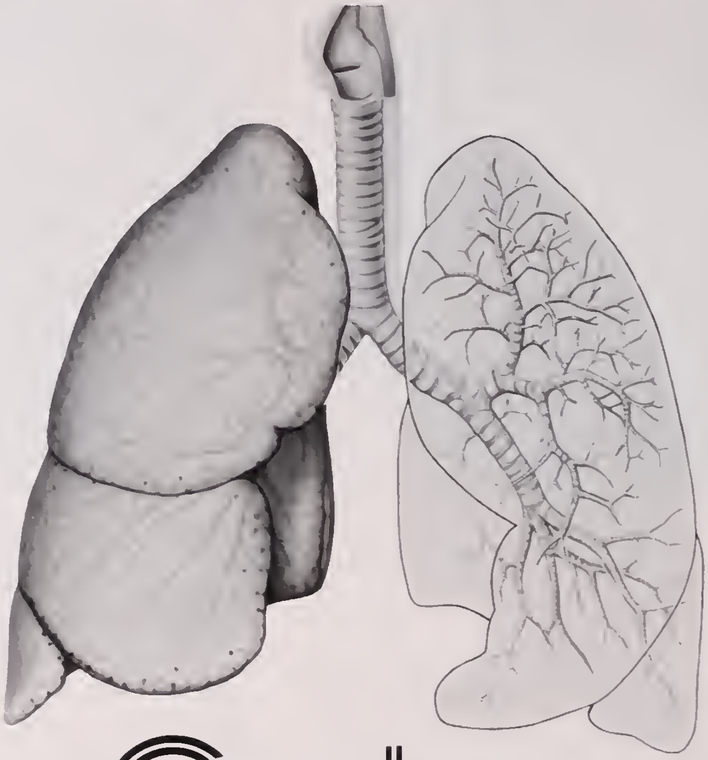

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Note: Ceclor® is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

Ceclor® (cefaclor)

Summary. Consult the package literature for prescribing information.

Indications: Lower respiratory infections, including pneumonia, caused by susceptible strains of *Streptococcus pneumoniae, Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococci).

Contraindications: Known allergy to cephalosporins.

Warnings: CECLOR SHOULD BE ADMINISTERED CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS. PENICILLINS AND CEPHALOSPORINS SHOW PARTIAL CROSS-ALLERGENICITY. POSSIBLE REACTIONS INCLUDE ANAPHYLAXIS.

Administer cautiously to allergic patients.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics. It must be considered in differential diagnosis of antibiotic-associated diarrhea. Colon flora is altered by broad-spectrum antibiotic treatment, possibly resulting in antibiotic-associated colitis.

Precautions:

- Discontinue Ceclor in the event of allergic reactions to it.
- Prolonged use may result in overgrowth of nonsusceptible organisms.
- Positive direct Coombs' tests have been reported during treatment with cephalosporins.
- In renal impairment, safe dosage of Ceclor may be lower than that usually recommended. Ceclor should be administered with caution in such patients.
- Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.
- Safety and effectiveness have not been determined in pregnancy, lactation, and infants less than one month old. Ceclor penetrates mother's milk. Exercise caution in prescribing for these patients.

Adverse Reactions: (percentage of patients)

Therapy-related adverse reactions are uncommon. Those reported include:

- Gastrointestinal (mostly diarrhea): 2.5%.
- Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment.
- Hypersensitivity reactions (including morbilliform eruptions, pruritus, urticaria, erythema multiforme, serum-sickness-like reactions): 1.5%; usually subside within a few days after cessation of therapy. These reactions have been reported more frequently in children than in adults and have usually occurred during or following a second course of therapy with Ceclor. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.
- Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.
- Other: eosinophilia, 2%; genital pruritus or vaginitis, less than 1%.

Abnormalities in laboratory results of uncertain etiology

- Slight elevations in hepatic enzymes.
- Transient fluctuations in leukocyte count (especially in infants and children)
- Abnormal urinalysis; elevations in BUN or serum creatinine
- Positive direct Coombs' test
- False-positive tests for urinary glucose with Benedict's or Fehling's solution and Clinitest® tablets but not with Tes-Tape® (glucose enzymatic test strip, Lilly)

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Imipenem: A Novel Carbapenem Antibiotic

LEO M. DARK, PharmD,* HUMPHREY ZOKUFA, PharmD,* JOHN C. ROTSCHAFER, PharmD*

N-formimidoyl thienamycin (imipenem) is a new carbapenem antibiotic with a broad spectrum of antimicrobial activity. The drug is active against aerobic gram positive cocci, aerobic gram negative baccilli, and anaerobes. Imipenem may be useful in a number of clinical situations, however, there is limited data at this time and more clinical studies are needed to further evaluate efficacy and safety of this new and relatively expensive antibiotic.

Pharmaceutical manufacturers perennially search for new and more effective antibiotics. Over the past few years their efforts have focused on the development of new beta-lactam antibiotics by substituting various side chains onto the penicillin or cephalosporin nucleus, modifying the antibiotic nucleus, or by combining the beta-lactam antibiotic with a beta-lactamase inhibitor.

N-formimidoyl thienamycin (MK 0787), or imipenem, is a new carbapenem antibiotic that most resembles a penicillin.[1,2,3,4] The drug is marketed in the United States under the trade name of Primaxin®, which is a combination of imipenem and cilastatin in a 1:1 ratio. Imipenem exhibits a broad spectrum of antimicrobial activity.[5,6,7] Information regarding the pharmacokinetics and toxicities associated with imipenem have not been extensively studied.[8,9] The purpose of this report is to review current data regarding the antibacterial spectrum, pharmacokinetics, and pharmacology of imipenem.

Pharmacology

Thienamycin is a new antibiotic discovered in 1976 that is produced from *Streptomyces cattleya*.[4,5,10-13] Thienamycin has a beta-lactam ring, but unlike penicillin, the five-membered ring does not contain a sulfur moiety (Figure).[10,13] Because of solution stability problems observed with the parent compound, an N-5-formimidoyl side chain was added to the structure[10] (Figure). This derivative was found to have approximately four times more antimicrobial activity against the same pathogens than the parent compound and was stable in solution with a water solubility of 11 mg/ml.[5,10] Unfortunately, the derivative, like the parent compound, appeared to be nephrotoxic.[13] In addition to the problems of drug stability and nephrotoxicity, preliminary studies demonstrated thienamycin and N-formimidoyl thienamycin (impenem) were extensively destroyed in the kidney by the enzyme dehydropeptidase, rendering both drugs ineffective for urosepsis.[1,9,13,14,15,26] The manufacturer attempted to solve this problem by administering imipenem with a dehydropeptidase inhibitor called cilastatin (MK 0791).[8,9,13,16] Cilastatin proved effective in preventing renal metabolism of the drug and seemed to prevent the nephrotoxicity previously associated with imipenem.[9,13] It was postulated that the nephrotoxicity observed was associated with a metabolized byproduct of thienamycin and imipenem.[9,13]

Imipenem has a mechanism of action similar to penicillins and cephalosporins, which bind to penicillin-binding proteins and interfere with cell wall synthesis.[17]

Cilastatin is used in a 1:1 ratio with imipenem, which maximally inhibits the renal metabolism of imipenem and maintains therapeutic urinary concentrations.[9,26] Cilastatin possesses no intrinsic antimicrobial activity and does not interfere with the antimicrobial activity of imipenem.[9,26] Cilastatin has little if any effect on plasma or cerebrospinal fluid concentrations of imipenem.[8,9,14]

Spectrum of Activity

Imipenem has a broad spectrum of antimicrobial activity.[7,16] The drug is active against aerobic gram positive cocci, aerobic gram negative bacilli, and anaerobes[6,16] (Table 1). In comparison with four commercially available third-generation cephalosporins, imipenem possesses far greater *in vitro* activity against *Pseudomonasa aeruginosa*, *Acinetobacter calcoaceticus*, enterococcus, *Bacteroides fragilis*, and Staphylococci.[6,10,18,19] This is based on the minimum antibiotic concentrations required to inhibit 50% and 90% (MIC-50, MIC-90) of the microbial isolates listed in Table 1.[6,10,18,19]

Nosocomial infections caused by aerobic gram negative pathogens such as *Pseudomonas aeruginosa*, *Acinetobacter calcoaceticus*, *Serratia marcescens*, *Escherichia coli*, and *Klebsiella pneumoniae* are inhibited *in vitro* by imipenem.[10] Imipenem possesses the greatest antimicrobial activity against *Pseudomonas aeruginosa* (MIC-90 1.9 mg/L) and

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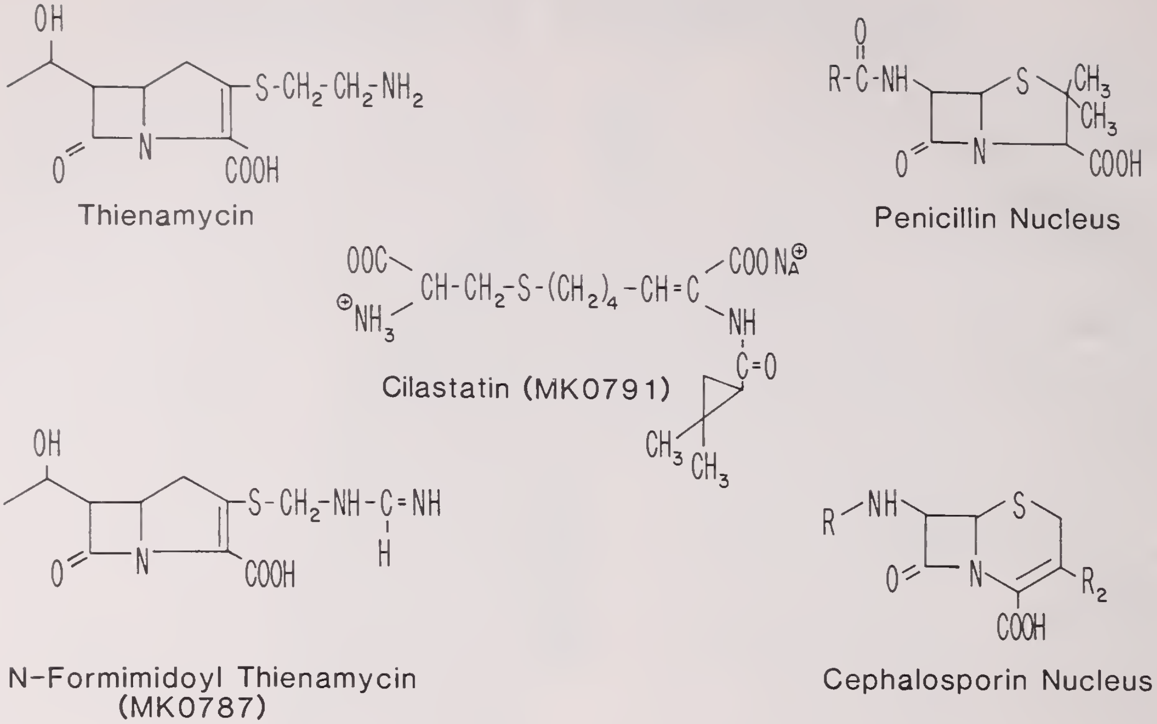

Figure - Thienamycin, structure.

Acinetobacter calcoaceticus (MIC-90 0.8 mg/L) of all antibiotics presented in Table 1. That is a 12-fold and a 100-fold difference in antimicrobial activity when compared to the third-generation cephalosporins.[10] Imipenem is not effective against *Pseudomonas maltophilia*[6,10] and *Pseudomonas cepacia*.[44] Imipenem may not be optimal as a single agent for the treatment of serious pseudomonal infections such as nosocomial pneumonia, pulmonary exacerbations of cystic fibrosis due to *Pseudomonas aeruginosa* because resistance to imipenem may emerge during treatment due to increased beta-lactamase production that can be associated with resistance to imipenem and other beta-lactam agents.[25,27,36,38,40] The combination of imipenem and an aminoglycoside should be considered for pseudomonal infections.[25,36] Imipenem possesses substantial *in vitro* activity against *Proteus mirabilis* and indole positive Proteus having MIC-90s of 2.9 mg/L and 1.9 mg/L, respectively.[10] However, the third-generation cephalosporins possess lower MIC-90s for *Proteus mirabilis* between 0.03 mg/L for Ceftizoxime to 1.6 mg/L for Cefoperazone.[10] Indole positive proteus have MIC-90s between 0.04 mg/L for Ceftizoxime and 1.4 mg/L for Cefoperazone.[10]

Imipenem has an MIC 90 of 2 mg/L for enterococci, which is approximately 25 times more active than third-generation cephalosporins.[19] Imipenem is no better *in vitro* against the enterococcus than penicillins and concomitant use of an aminoglycoside should be considered.[23,24] Imipenem and gentamicin are synergistic against tolerant *Streptococcus faecalis* and *Streptococcus faecium*.[44] There are reports of penicillin-resistant strains of *Streptococcus pneumoniae* from South Africa also being resistant to imipenem.[20,22] Subinhibitory concentrations of imipenem induced increased resistance to imipenem *in vitro* in methicillin-resistant *Staphylococcus aureus*.[20,21,41] Imipenem, however, was 91% and 92% effective in treating methicillin-resistant and methicillin-sensitive *Staphylococcus aureus* infections, respectively.[41] More clinical trials are necessary to establish the efficacy of imipenem against serious *Stephylococcus aureus* infections especially methicillin-resistant organisms and the clinical significance of *in vitro* induced resistance.

Imipenem appears to be an effective antibiotic for *Bacteroides fragilis* and *Clostridium difficile*.[6,10,18] The MIC-90 of imipenem for *Bacteroides fragilis* is 0.15 mg/L, which is a 100-fold more active than

TABLE 1

Comparison of antimicrobial activity of thienamycin and 3rd-generation cephalosporins

	N-F-Thienamycin		*Moxalactam*		*Cefoperazone*		*Cefotaxime*		*Ceftizoxime*	
	MIC-50 (MG/L)	MIC-90 (MG/L)	MIC 50 (MG/L)	MIC 90 (MG/L)	MIC 50 (MG/L)	MIC 90 (MG/L)	MIC 50 (MG/L)	MIC 90 (MG/L)	MIC 50 (MG/L)	MIC 90 (MG/L)
Staphylococcus aureus	≤0.03	≤0.03	8.0	8.0	1.3	2.9	1.2	1.8	2	5.7
Staphylococcus aureus (M.R.S.)	0.05	0.1	18.5	32.0	21.5	32	14	32	>256	>256
Staphylococcus epidermidis	≤0.03	≤0.03	8.0	11.5	0.76	4	0.4	4.0	0.21	4
Staphylococcus epidermidis (M.R.S.)	≤0.03	≤0.05	8.0	14	1.0	2.0	1.0	4.0	0.25	32
Streptococcus pneumoniae	≤0.03	≤0.03	0.7	2.0	≤0.03	0.125	≤0.03	≤0.03	≤0.03	0.06
Group A Streptococcus	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Enterococcus	1.0	2.0	>128	>128	25	50	>128	>128	N.S.	N.S.
Pseudomonas aeruginosa	1.3	1.9	10.3	24.5	4.8	43	12	46	17.5	51
Acinetobacter calcoaceticus	0.34	0.8	16	64	76	256	19	46	9.6	23
Serratia marcescens	0.125	0.2	0.14	0.23	2.0	16	0.15	0.5	≤0.03	0.06
Escherichia coli	0.09	0.125	0.04	0.08	0.11	0.5	≤0.03	0.05	≤0.03	≤0.03
Klebsiella pneumoniae	0.08	0.125	0.04	0.1	0.12	2.0	≤0.03	0.04	≤0.03	≤0.03
Proteus mirabilis	1.0	2.9	0.07	0.11	0.44	1.6	≤0.03	≤0.03	≤0.03	≤0.03
Proteus Indole (+)	1.3	1.9	0.04	0.06	0.42	1.4	≤0.03	0.05	≤0.03	0.04
Bacteroides fragilis	≤0.03	0.15	6.3	25	12.5	>100	25	50	N.S.	N.S.
Clostridium difficile	1.3	1.9	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	

N.S. Not stated
MIC 50 Minimum concentration required to inhibit 50% of the isolates
MIC 90 Minimum concentration required to inhibit 90% of the isolates
M.R.S. Methicillin-resistant

third-generation cephalosporins.[10] The MIC-90 for imipenem against *B. fragilis* is comparable to clindamycin and metronidazole, which are 2.2 mg/L and 0.96 mg/L, respectively.[10] While imipenem has an MIC-90 of 1.9 mg/L for *Clostridium difficile*, the drug may not be useful in treating pseudomembranous colitis, as imipenem, when given intravenously, may not produce suitable antimicrobial concentrations in the bowel.[10]

Cure rates of < 80% (Table 2) have been obtained with most of the studies done in patients with moderate to severe bacterial infections.[39] Caution should be exercised when evaluating these new antimicrobial agents. Inherent in all drug study protocols is the fact that sample sizes are relatively small compared with the number of patients likely to receive the agent on a nationwide basis. Clinical efficacy in these studies may tend to be overstated as treatment often focuses on uncomplicated infections caused by common and easily treated bacteria. In addition, most study protocols require that the initial infecting pathogen be sensitive to the antibiotic being tested. Infections caused by resistant isolates are excluded from data analysis. Therefore, cure rates in excess of 90% are not surprising. Careful consideration should also be given to protocol definitions of cure vs. improvement vs. failure. Ultimately, the incidence of adverse drug reactions, cost, and the emergence of resistance should also be considered.

Pharmacokinetics

Imipenem appears best characterized by a two compartment pharmocokinetic model.[9,14] The pharmacokinetics of imipenem and cilastatin are linear over the therapeutic dosage range, and no accumulation of either drug has been demonstrated. Reduced renal function slows the elimination of imipenem and cilastatin and requires dosage reduction when the glomerular filtration is reduced.[26] Imipenem has a mean beta phase half-life of approximately one hour, central compartment distribution volume of approximately 0.16 liters/kg, overall volume of distribution of drug in the body of approximately 0.2 liters/kg, and a volume of distribution at steady state of 0.23 liters/kg.[14,26,46] Plasma clearance of imipenem has been estimated at 3 ml/min/kg.[14]

Four inactive metabolites of imipenem are excreted in the urine.[16] A minor portion of imipenem is excreted by tubular secretion.[14] Timed (10 hour) urine collections recover between 6% and 38% of the imipenem dose administered without cilastatin and approximately 70% of the drug with cilastatin.[14,26] A 500 mg dose of imipenem infused over 20 minutes every 6 hours without cilastatin produces mean peak and trough urinary concentrations of approximately 300 mg/L and 10 mg/L respectively.[9] When this dose was administered with cilastatin there was a 3-fold increase in mean peak urinary concentration.[9] This dose of imipenem produced a mean peak plasma concentration of approximately 60 mg/L and a 4-hour trough concentration of 1.5 mg/L.[14] The concentrations of imipenem/cilastatin in pus, sputum, and bone are sufficient to inhibit most infecting organisms.[42]

TABLE 2

Cure rates observed with imipenem/cilastatin treatment of the different types of infection

Type of Infection	*Cure Rate*	*Dose*
Lung, soft tissue, and renal infections[28]	n = 16 100%	500 mg IV every 8 hours for 4 days
Severe bacterial infections (bacteremia, osteomyelitis soft tissue infection, mediastroytis, urinary tract infection, lower respiratory tract infection)[29]	n = 10 90%	500 mg IV every 8 hours for 5-14 days
Serious bacterial infections (pneumonia, pyelonephritis, osteomyelitis, intravascular infection, soft tissue infection)[30]	n = 49 79%	1-4 g per day in 3 or 4 divided doses for 5-42 days
Serious bacterial infections (respiratory, genito-urinary intra-abdominal, soft tissue)[31]	n = 33 79%	0.75-4 g per day IV in 3 or 4 divided doses for 5 days
Various bacterial infections (respiratory tract, abdominal, skin and soft tissue, systemic, urinary tract)[32]	n = 256 75.7%	1600 mg IV per day for 8.5 days
Lower respiratory tract infection[33]	n = 204 85%	0.75-4 g IV per day for 4-39 days mean = 11 days
Intra-abdominal infections[34]	n = 164 91%	1-4 g IV per day every 6 to 8 hours for 4-41 days mean = 10.1 days
Obstetric and gynecological infections[35]	n = 72 97%	1-4 g IV per day for 4-15 days
Infection of all body systems except central nervous system[36]	n = 1723 92%	1-4 g IV per day every 6-8 hrs for 5 days

Toxicity

Adverse effects associated with imipenem are similar in nature to other beta-lactam antibiotics.[25] Weakness, dizziness, diarrhea, nausea, and sweating are the most common side effects.[16] Nausea and vomiting sometimes accompanied by hypotension, dizziness, or sweating have been attributed to the rate of intravenous infusion.[36,37] Slowing the infusion rate, however, does not always prevent this syndrome from occurring.[36,37] Problems related to the site of infusion were thrombophlebitis and pain on infusion.[36,37]

Seizures have been reported in some patients who receive imipenem/cilastatin. Likely the seizures were due to large doses of imipenem, as the seizure disorder abated with an adjustment in dose or discontinuation of therapy.[36,37] Bacterial superinfections commonly caused by *Pseudomonas aeruginosa*, *Pseudomonas maltophilia*, and fungi have been reported in a small proportion of patients.[36,37]

The predominant changes in hematologic parameters reported as adverse experiences were eosinophilia, the development of a positive Coomb's test, increased platelet and monocyte counts, and neutropenia.[13,36,37] Drug-related elevations of hepatic enzymes were transient and predominantly those of aspartate and alanine amino transferases and alkaline phosphatase.[13,36,37] Pseudomembranous colitis was rarely reported as a finding associated with imipenem/cilastatin usage.[36,37] Most of these adverse reactions reported with imipenem have not required the discontinuing of therapy.[13,17,36,37]

Conclusion

The safety profile of imipenem is similar to other beta-lactam antibiotics. Whether patients allergic to other beta-lactam antibiotics can be safely given imipenem/cilastatin has not been systematically studied.[36] Nausea and vomiting may be ameliorated with slowing of the intravenous infusion, particularly when larger doses are required.[36] The potential occurrence of superinfection with the use of imipenem/cilastatin is of great concern and should be monitored.

Imipenem is a promising new antibiotic with many potential clinical applications. With time, the role of this antibiotic will become more clearly defined. Because of the high cost associated with imipenem, the clinician should carefully evaluate other antibiotic alternatives before considering use of this new agent.

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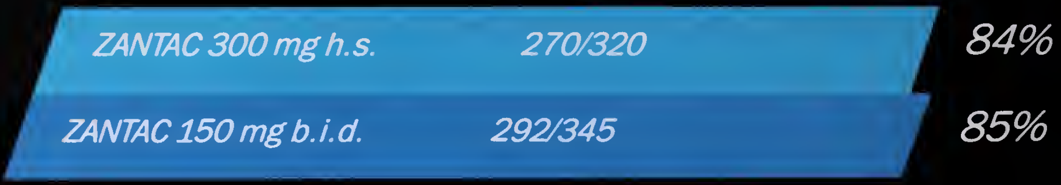
CONTROL ACID RAIN

with once-a-night h.s. therapy for active duodenal ulcers

Only one tablet at bedtime

Controls nocturnal acid to relieve pain and heal duodenal ulcers

***Heals active duodenal ulcers after 4 weeks in most patients**[*][1]*



In well-controlled, double-blind, multicenter trials, ZANTAC 300 mg h.s. healed active duodenal ulcers in 84% of patients after 4 weeks. After 8 weeks, healing rates may be higher with ZANTAC 150 mg b.i.d. (92%) than with ZANTAC 300 mg h.s. (87%).

***Relieves pain and other symptoms as effectively as ZANTAC 150 mg b.i.d.**[1]*

Zantac® 300

ranitidine HCl/Glaxo 300 mg tablets

Once-daily dosing may enhance compliance in patients for whom dosing convenience is important

Side-effects profile comparable to ZANTAC 150 mg b.i.d.[1-3]

Headache—sometimes severe—has been reported. Rare effects on the CNS, cardiovascular, GI, hepatic, and integumental systems have been observed, as well as rare cases of hypersensitivity reactions. See ADVERSE REACTIONS section of Brief Summary of Product Information before prescribing.

No significant interference with the hepatic cytochrome P-450 enzyme system at recommended doses

ZANTAC 300 mg h.s. had no significant drug interactions with theophylline or warfarin. The bioavailability of certain medications whose absorption is dependent on a low gastric pH may be altered when ZANTAC or other medications which decrease gastric acidity are administered.

Glaxo/ROCHE

See next page for references and Brief Summary of Product Information.

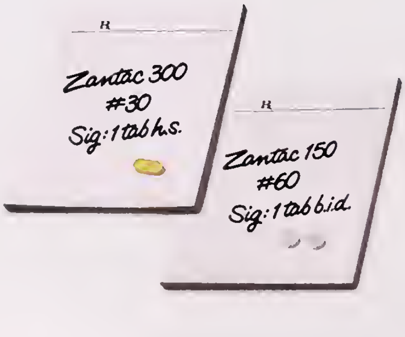
**It is not known exactly how much acid inhibition is needed to heal ulcers.*

IN ACTIVE DUODENAL ULCERS

Once-a-night h.s. therapy controls acid rain

Zantac® 300
ranitidine HCl/Glaxo 300 mg tablets

Two effective regimens to treat active duodenal ulcers:



References: 1. Data available on request, Glaxo Inc. **2.** Ireland A, Colin-Jones DG, Gear P, et al: Ranitidine 150 mg twice daily vs 300 mg nightly in treatment of duodenal ulcers. *Lancet* 1984;2:274-275. **3.** Colin-Jones DG, Ireland A, Gear P, et al: Reducing overnight secretion of acid to heal duodenal ulcers. *Am J Med* 1984, 77 (suppl 5B) 116-122.

ZANTAC® 150 Tablets (ranitidine hydrochloride)
ZANTAC® 300 Tablets (ranitidine hydrochloride)

BRIEF SUMMARY OF PRODUCT INFORMATION

See complete product information before prescribing. The following is a brief summary.

INDICATIONS AND USAGE: ZANTAC® is indicated in:

1. Short-term treatment of **active duodenal ulcer**. Most patients heal within four weeks.
2. **Maintenance therapy** for duodenal ulcer patients at reduced dosage after healing of acute ulcers.
3. The treatment of **pathological hypersecretory conditions** (eg, Zollinger-Ellison syndrome and systemic mastocytosis).
4. Short-term treatment of **active, benign gastric ulcer**. Most patients heal within six weeks and the usefulness of further treatment has not been demonstrated.
5. Treatment of **gastroesophageal reflux disease (GERD)**. Symptomatic relief commonly occurs within one or two weeks after starting therapy. Therapy for longer than six weeks has not been studied.

In active duodenal ulcer; active, benign gastric ulcer; hypersecretory states; and GERD, concomitant antacids should be given as needed for relief of pain.

CONTRAINDICATIONS: ZANTAC® is contraindicated for patients known to have hypersensitivity to the drug.

PRECAUTIONS: General: 1. Symptomatic response to ZANTAC® therapy does not preclude the presence of gastric malignancy. 2. Since ZANTAC is excreted primarily by the kidney, dosage should be adjusted in patients with impaired renal function. Caution should be observed in patients with hepatic dysfunction since ZANTAC is metabolized in the liver.

Laboratory Tests: False-positive tests for urine protein with Multistix® may occur during ZANTAC therapy, and therefore testing with sulfosalicylic acid is recommended.

Drug Interactions: Although ZANTAC has been reported to bind weakly to cytochrome P-450 in vitro, recommended doses of the drug do not inhibit the action of the cytochrome P-450-linked oxygenase enzymes in the liver. However, there have been isolated reports of drug interactions which suggest that ZANTAC may affect the bioavailability of certain drugs by some mechanism as yet unidentified (eg, a pH-dependent effect on absorption or a change in volume of distribution).

Carcinogenesis, Mutagenesis, Impairment of Fertility: There was no indication of tumorigenic or carcinogenic effects in lifespan studies in mice and rats at doses up to 2,000 mg/kg/day.

Ranitidine was not mutagenic in standard bacterial tests (*Salmonella, E coli*) for mutagenicity at concentrations up to the maximum recommended for these assays.

In a dominant lethal assay, a single oral dose of 1,000 mg/kg to male rats was without effect on the outcome of two matings per week for the next nine weeks.

Pregnancy: *Teratogenic Effects: Pregnancy Category B:* Reproduction studies have been performed in rats and rabbits at doses up to 160 times the human dose and have revealed no evidence of impaired fertility or harm to the fetus due to ZANTAC. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers: ZANTAC is secreted in human milk. Caution should be exercised when ZANTAC is administered to a nursing mother.

Pediatric Use: Safety and effectiveness in children have not been established.

Use in Elderly Patients: Ulcer healing rates in elderly patients (65 to 82 years of age) were no different from those in younger age groups. The incidence rates for adverse events and laboratory abnormalities were also not different from those seen in other age groups.

ADVERSE REACTIONS: The following have been reported as events in clinical trials or in the routine management of patients treated with oral ZANTAC®. The relationship to ZANTAC therapy has been unclear in many cases. Headache, sometimes severe, seems to be related to ZANTAC administration.

Central Nervous System: Rarely, malaise, dizziness, somnolence, insomnia, and vertigo. Rare cases of reversible mental confusion, agitation, depression, and hallucinations have been reported, predominantly in severely ill elderly patients.

Cardiovascular: Rare reports of tachycardia, bradycardia, and premature ventricular beats.

Gastrointestinal: Constipation, diarrhea, nausea/vomiting, and abdominal discomfort/pain.

Hepatic: In normal volunteers, SGPT values were increased to at least twice the pretreatment levels in 6 of 12 subjects receiving 100 mg qid IV for seven days, and in 4 of 24 subjects receiving 50 mg qid IV for five days. With oral administration there have been occasional reports of reversible hepatitis, hepatocellular or hepatocanalicular or mixed, with or without jaundice.

Musculoskeletal: Rare reports of arthralgias.

Hematologic: Rare reports of reversible leukopenia, granulocytopenia, thrombocytopenia, and pancytopenia.

Endocrine: Controlled studies in animals and man have shown no stimulation of any pituitary hormone by ZANTAC and no antiandrogenic activity, and cimetidine-induced gynecomastia and impotence in hypersecretory patients have resolved when ZANTAC has been substituted. However, occasional cases of gynecomastia, impotence, and loss of libido have been reported in male patients receiving ZANTAC, but the incidence did not differ from that in the general population.

Integumental: Rash, including rare cases suggestive of mild erythema multiforme, and, rarely, alopecia.

Other: Rare cases of hypersensitivity reactions (eg, bronchospasm, fever, rash, eosinophilia) and small increases in serum creatinine.

DOSAGE AND ADMINISTRATION: Active Duodenal Ulcer: The current recommended adult oral dosage is 150 mg twice daily. An alternate dosage of 300 mg once daily at bedtime can be used for patients in whom dosing convenience is important. The advantages of one treatment regimen compared to the other in a particular patient population have yet to be demonstrated.

Maintenance Therapy: The current recommended adult oral dosage is 150 mg at bedtime.

Pathological Hypersecretory Conditions (such as Zollinger-Ellison Syndrome): The current recommended adult oral dosage is 150 mg twice a day. In some patients it may be necessary to administer ZANTAC® 150-mg doses more frequently. Doses should be adjusted to individual patient needs, and should continue as long as clinically indicated. Doses up to 6 g/day have been employed in patients with severe disease.

Benign Gastric Ulcer: The current recommended adult oral dosage is 150 mg twice a day.

GERD: The current recommended adult oral dosage is 150 mg twice a day.

See full prescribing information for dosage adjustment for patients with impaired renal function.

HOW SUPPLIED: ZANTAC® 300 Tablets (ranitidine hydrochloride equivalent to 300 mg of ranitidine) are yellow, capsule-shaped tablets embossed with "ZANTAC 300" on one side and "Glaxo" on the other. They are available in bottles of 30 (NDC 0173-0393-40) and unit dose packs of 100 tablets (NDC 0173-0393-47).

ZANTAC® 150 Tablets (ranitidine hydrochloride equivalent to 150 mg of ranitidine) are white tablets embossed with "ZANTAC 150" on one side and "Glaxo" on the other. They are available in bottles of 60 tablets (NDC 0173-0344-42) and unit dose packs of 100 tablets (NDC 0173-0344-47).

Store between 15° and 30°C (59° and 86°F) in a dry place. Protect from light. Replace cap securely after each opening.

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Glaxo
Glaxo Inc
Research Triangle Park, NC 27709

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ZAN309R Printed in U.S.A September 1986

The I-Hate-Quality-Assurance Cookbook

GORDON MOSSER, M.D.*,
and JUDITH A JOHNSON, R.N., M.P.H.*

Some physicians have to do quality assurance although they dislike it. Other physicians would like to try quality assurance and seek a simple guide for use in getting started. Here is a 10-step recipe for carrying out a quality assurance project in a group practice. The recipe explains how to define a performance standard, how to conduct an audit, how to correct a deficiency and how to show that the deficiency has been corrected.

Many years ago Peg Bracken wrote *The I Hate to Cook Book* for those who had to cook but disliked it. She also wrote it for those who wanted to learn to cook but did not want to admit it. For some time now, there has been a need for a similar guide to quality assurance.

Most physicians were first introduced to quality assurance through Professional Standards Review Organizations (PSROs). The history of PSROs was marked by political storms and equivocal results.[1] From the vantage point of practicing physicians, PSROs were externally imposed bureaucracies that appeared to produce a great deal of paper with little effect on patient care. They also appeared to be hypocritical because they professed to deal with both quality and costs but in practice dealt with costs almost exclusively. Because of these perceived defects, PSROs produced scorn for quality assurance among many physicians. Other physicians remained interested in quality assurance but learned to keep quiet to avoid being labeled "bureaucractic" or worse.

Despite their dislike for quality assurance, many physician groups are obliged to pursue it because various health maintenance organizations and granting agencies insist on quality assurance programs. There are also still a few groups that would like to try quality assurance because they suspect that it might actually improve patient care in their practices.

For those who have to do quality assurance, here is a 10-step recipe that will be as easy to follow as one of Mrs. Bracken's. It may also be used by those who secretly want to try quality assurance but who do not want to get caught with a manual analogous to *The New James Beard*. The recipe will yield best results when used in a group practice of four or more physicians.

The Recipe

1. Choose a topic. The topic should be an area of clinical performance in which there is potential for improvement. The deficiency should be clinically important, genuinely suspected, and correctable. For example, one might seek to improve the follow-up of hypertensive patients. A project is most likely to be successful in finding and correcting a problem when the topic is chosen through group discussion among the physicians in the practice. The discussion might be based on a review of office medical records. If consensus is difficult to achieve through informal discussion, formal group process techniques are available.[2]

2. Define the standard. Defining the standard establishes a benchmark against which clinical activity can be measured in an audit. For example, in a project aimed at improving childhood immunization, the group might define the standard in this way: Ninety percent or more of two-year-old children shall have medical record entries showing that they have received all immunizations recommended by the American Academy of Pediatrics." The standard should be established by consensus among the physicians since their future adherence to the standard cannot be expected if they disagree with it. For some topics, agreement can be achieved through review of the medical literature. For other topics, sharing of expert opinion among the physicians can be used when the literature does not support any particular standard unambiguously. In dealing with some topics, the concept of a "minimum standard" is useful. For example, if the group disagrees over whether women should have Papanicolaou smears done every year or every three years, they will be able to proceed with a project if they use the lower frequency in defining the standard and are explicit in labeling the standard as the minimum that should be achieved. They could define the standard to be: "Ninety percent of women aged 18-69 years of age shall at a minimum have Papanicolaou smear results less than three years old in their medical records." Some topics do not lend

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*Qualas, the Quality Assurance Program of Aspen Medical Group, Minneapolis and St. Paul, Minnesota.
Reprint requests: Aspen Medical Group, 1020 Bandana Boulevard West, St. Paul, Minnesota 55108.

themselves to quality assurance projects because the medical literature is too inconclusive to permit the group to come to agreement on a standard.

The choice of the target success percentage depends upon the topic. Usually the physicians will agree on 90% compliance in defining the standard. Seeking perfection usually results in spending effort that could be better spent elsewhere. However, for some topics nothing less than 100% success will do. For example, most physician groups would reject the standard: "Ninety percent of women with class IV or V Papanicolaou smears shall be followed up within one month of the date the smear was taken." For some topics, the percentage may be set at 80 or 85 if failure to meet the standard has minor consequences and higher rates of success are difficult to achieve.

In formulating the standard, one must keep in mind how the audit will actually be performed. The standard and the available data need to permit the reviewer to classify every case as a success or a failure in meeting the standard. An audit result of 60% success, 15% failure, and 25% indeterminate cases will not be useful for comparison with a subsequent audit result obtained after attempts have been made to correct the deficiency. Some topics are not suitable for projects because no standard can be defined with sufficient precision to permit this black-or-white separation of successes and failures. Some topics are not suitable because the necessary information is not regularly recorded in the medical records.

3. Determine how the audit sample will be selected. The "target population" consists of all patients in the practice to whom the standard of care applies. The audit sample should be representative of the target population. For example, if the topic is adult-onset diabetes mellitus, the sample should be selected so that it is typical of all patients with this disorder. Ideally, the sample should be chosen by strict random selection from a complete list of all patients in the target population. A random number table is a disagreeable thing to many physicians, but it need not be. Its use can be explained in one page and learned in two minutes.[3] The ideal approach can be used in practices that maintain card-file diagnostic indexes. In other practices, the billing system can provide diagnostic information that nearly matches the ideal case. Sometimes appointment lists can be used with almost the same result.

Sometimes the target population is defined by age and sex. For example, one might want to audit the records of women aged 50 years or more to see whether annual screening mammograms have been ordered. In this case a patient roster or a mailing list could be used to derive the sample.

The method of sample selection depends upon the topic, the standard, and the data available in the practice. Often the goal of true representativeness can only be approximated. This limitation would spoil a research report addressed to a general scientific readership, but a quality assurance audit is a management inquiry, not a research project. Audit results are interpreted by the physicians in a practice against a background of knowledge about what is plausible and implausible in their setting. Methods that are sufficient to show the physicians that action is needed may not be sufficient to convince a scholarly skeptic who lacks their knowledge of the practice.

4. Determine the size of the sample. Exact sample size determination depends upon four factors: the success rate expected in the initial audit, the minimum improvement desired by the time of the follow-up audit, the acceptable risk of failing to prove real improvement, and the acceptable risk of appearing to have demonstrated improvement when there really is none. All four factors can be represented mathematically in formulas used for calculating sample size.[4] However, this approach is generally not practical since it usually requires consultation with a statistician.

A simpler but still satisfactory approach depends upon only two factors: the expected success rate in the initial audit and the desired 95% confidence limits for this rate. The expected success rate can usually be predicted on the basis of similar audits done elsewhere or on the basis of the physicians' pooled guesses. The 95% confidence limits show the precision attained in measuring the success rate. A report of 80 + 6% success in the audit sample means that the success rate in the target population is 95% likely to lie between 74 and 86%. Setting the acceptable confidence limits is a matter of choice. Most physicians will find limits of + 7% to be acceptable. With the success rate predicted and the confidence limits chosen, one can calculate the sample size:

$$n = 3.84 \quad \frac{p(1-p)}{c^2}$$

where, n = sample size,
p = the expected success rate,
c = the acceptable confidence limits (± c).

Even this small serving of statistics is distasteful to some physicians. As a rule of thumb, one may simply use a sample size of 100. Most audits show success rates of 80% or higher. With 100 cases and a success rate of 85%, the confidence limits are + 7%. More importantly, with 100 cases in the initial audit and in the follow-up audit, one will be reasonably likely to demonstrate a genuine increase of 15 percentage points in the success rate. With sample sizes of 100, one will generally not be able to demonstrate improvements of less than 15 percentage points. This limitation rarely has any practical importance because improvements of such small magnitude are ordinarily not worth the time and effort needed to achieve them. In other words, if a project is worth doing, its success can almost always be proven with sample sizes of 100.

5. Write the prospectus. Writing a prospectus for the project provides useful discipline in avoiding a wasted effort. The purpose of a project is to find and to correct a deficiency. A project is a waste of time if it fails to confirm a suspected deficiency or if it confirms a deficiency that cannot be corrected.

The prospectus should be one or two pages and should consist of:

a) a statement of why the deficiency is suspected and why it is important;

b) a statement of the standard with supporting reference to any pertinent medical literature;

c) a description of the audit methods, including how the sample will be chosen, what the sample size will be, and whether the data will be collected by a review of records, a survey of patients, or some other method;

d) a statement of what corrective action is anticipated in the event that the suspected deficiency is confirmed;

e) a statement of the timetable for the project, including the completion date for the initial audit, the time anticipated to be needed to correct the problem, and the completion date for the follow-up audit.

6. Do the initial audit. The actual drawing of the sample and collecting of the data can usually be delegated to a nurse, clerk, or medical records technician. A worksheet should be used to record for each case whether it meets the standard or not. Some audits require medical inferences to be drawn from data in medical records. For these audits, usually a physician will need to collect the data.

Even when the task could be delegated, collection of the data by a physician increases the likelihood of a successful project. Collecting the data gives the physician an opportunity to notice other information that will be useful in correcting the problem. Actually doing the audit also usually heightens the physician's commitment to the project and makes him or her a more effective advocate for change when action is being planned.

7. Make a plan for correcting the problem. After the audit results are available, the action plan needs to be reformulated in the light of what has been found. The results should be presented to the physicians whose consensus underwrote the standard. Again, consensus on a plan is essential for a successful outcome to the project.

The plan might consist of establishing a recall system for hypertensive patients. It might consist of adding a flowsheet to the medical record to remind the physicians to perform periodic tests for patients taking warfarin or patients with chronic renal failure. Holding a continuing education session is generally less effective than instituting a systems change to prompt action.

8. Write the audit report. The principal value of the audit report is that it sets forth clearly what the planned action will be. Clarity spurs action. The report also provides a summary of the audit results for quick reference in the future.

The report should include a reiteration of why the project is being done, what the standard is, and what the audit methods were. It should present the results clearly. A casual reader should be able to identify the basic success rate in less than a minute. The planned action should be described. A revised timetable for action and re-audit should be presented. The report may consist of the prospectus with the results, action plan, and new timetable appended. It should be four or five pages in length.

9. Correct the problem. Most effective action plans consist of systems changes resulting in new tasks that are delegated to support staff. For example, a recall system might be instituted to ensure diabetic eye care. The medical records of diabetic patients could be reviewed annually by a nurse to determine whether they have been examined with a slit lamp by an ophthalmologist. Those who have not been examined could be telephoned or sent a postcard as a reminder. Some problems require six months for correction, seldom less. Some problems require two years.

The correction of the problem is more likely to be successful if the person coordinating the project is *prohibited* from initiating action. The action should be taken by whatever executive authority exists in the medical group. In small group practices, this authority is ordinarily vested in the whole group acting through consensus-based decisions at group meetings. In other groups, a designated leader may be authorized to act if he or she is reasonably certain that the other members will not object to the action. In large groups, department chairs may have this authority. A physician pursuing a quality assurance project should not take action to correct a problem unless he or she is authorized to take such action according to the group's customary rules of decision making. The coordinating physician must be especially careful here since these rules are often informal and unspoken. For example, small group practices usually operate as pure partnerships with a natural political leader who is tacitly authorized to make business decisions but not decisions about clinical systems. If the coordinating physician happens to be this leader, he may unwittingly exceed his authority by establishing a recall system or taking some other action. Unless the change is underwritten by consensus, that physician risks becoming an unwanted policeman. The change can be expected to be resisted or resented. The project will wither because of polite neglect by the other physicians. In general, a physician pursuing a project should not accept authority for deciding upon corrective action even if this authority is offered to him or her. Quality assurance is most successful when it is a facilitating and prompting activity.

10. Do the follow-up audit. The project cycle is completed by repeating the audit after the corrective action has had time to take effect. The methods of the follow-up audit should be the same as those of the initial audit so that the results can be compared. Because the follow-up audit is performed many months after the action has been initiated, it is helpful to mark the time for the audit on a calendar so that the project's timetable is not neglected. The results of both the new audit and the initial audit should be presented to the physicians who authorized the action. A new action plan should be formulated, or an explicit decision should be made that no further action will be taken. A brief follow-up audit report should be written to record the results of the new audit and should include a conclusion about whether improvement was achieved. Any new action plan should also be recorded. In the event that the group decides not to take further action, the reasons for the decision should be stated.

Conclusion

This recipe will produce a workmanlike quality assurance project every time. A deficiency will have been found and corrected. Garnish the result with your own satisfaction. There is no need to mention that formulating the standard was a matter of common sense, that you used a simple rule of thumb in choosing the sample size, or that correcting the problem was a matter of prompting the other physicians to do what they already wanted to do.

To produce a full quality assurance program, carry on by repeating the recipe with new topics and standards. Then add some regular meetings for generating ideas for projects. For example, add a bimonthly chart review meeting in which the physicians discuss each others' medical records. Or add a periodic discussion of tallies of patients' suggestions or complaints. A regular review of emergency hospital admissions might provide ideas. But stop. The recipes for these activities do not belong in Mrs. Bracken's cookbook. They belong instead in books for those who like to cook.[5,6]

Acknowledgments

The authors thank Angie Smith, R.N., and Lawrence Kaplan, M.D., for critically reviewing earlier versions of this recipe.

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MMIE Malpractice Claim Review

Family Practice Clinic

MMIE RISK MANAGEMENT COMMITTEE
PAUL S. SANDERS, M.D.
CHAIRPERSON

Allegation

Negligent supervision of the patient by a clinic nurse.

Facts

The patient, a 78-year-old retired farmer, was seen by Dr. X, a family physician, for severe degenerative arthritis of both knees. Dr. X referred him to Dr. Y, an orthopedic surgeon, for surgical consultation. Dr. Y performed bilateral knee replacements; the right knee surgery was done on March 18, 1983, and the left knee on March 29. The patient was discharged from the hospital on April 9. A follow-up X-ray taken by Dr. Y on April 29 showed both knee prostheses in good position and alignment.

On May 3, the patient had an appointment scheduled with Dr. X for evaluation of left knee pain and difficulty with ambulation. While checking him into the clinic, Dr. X's nurse asked the patient to step up onto a scale to be weighed. The patient grabbed onto the scale for support, but the nurse did not assist him in any way. While attempting to step onto the scale, the patient's left leg buckled and he fell, hitting his left knee on the floor. He was in severe pain and was unable to bear weight on the left leg. Dr. X referred him back to Dr. Y who hospitalized him for a fractured patella.

On May 5, Dr. Y performed an open reduction of the fracture. The patient was discharged on May 13 but continued to have left knee pain on ambulation. He was readmitted on June 8 for physical therapy. When his progress was determined to be unsatisfactory, Dr. Y performed a subtotal patellectomy of the left knee on June 15. The patient was discharged from this hospitalization on June 18.

The patient's last examination by Dr. Y was six months later when it was noted that he was walking independently but had a 50% permanent disability of his left lower extremity.

Disposition

$25,000 settlement on behalf of Dr. X's clinic.

Reason for Settlement

Because the nurse was aware of the patient's recent knee replacements and difficulty with ambulation, she had a duty to more closely supervise his activities while in the clinic and protect him from foreseeable injuries. There was no argument that she failed to uphold this duty; negotiations centered solely on ascertaining the degree of damages.

Risk Management Comments

Many patient injuries occur in the clinic setting when patients are not properly supervised. Elderly, disabled, and disoriented patients frequently suffer falls that should have been preventable by the attending nurses or other clinic staff. When dealing with this group of patients, a greater duty is imposed on health care providers to anticipate potential problems, provide closer monitoring, and offer appropriate assistance to protect the patients from foreseeable injuries. Failure to uphold this duty may result in a lawsuit and finding of liability. In some cases, the negligent employee as well as the clinic may be named as a defendant.

Under the doctrine of respondeat superior, clinics will be held responsible for the negligence of their employees. It is essential the clinic administrators and supervising physicians be aware of the types of patient injuries and resultant malpractice claims that can arise from the acts or omissions of employees. Close supervision and periodic inservice training should be provided for all employees to help clinics prevent patient injuries and minimize liability exposure.

Minnesota Physician's Directory

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Robert M. Wagner, M.D.
David J. Olson, M.D.
Thomas C. Carrier, M.D.
Gordon L. Alexander, M.D.
John C. Ellis, Jr., M.D.
Jan L. Duquette, M.D.

Are Pleased To Welcome
Judith M. Stark, M.D.

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3-1/87

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CONTINUING MEDICAL EDUCATION
ST. PAUL-RAMSEY MEDICAL CENTER
Fall-Spring Conference Schedule

Mark your calendar now for these upcoming conferences:

1987

January 30	Detection and Diagnosis of Substance Use Disorders, St. Paul, MN
February 6	Burn Care Update, St. Paul, MN
March 4-7	Fifth Annual Critical Care Conference, St. Paul, MN
March 20-21	Eighth Annual Occupational Medicine Update, St. Paul, MN
April 2-4	Strategies in Primary Care Medicine, St. Paul, MN
April 9-10	Obstetrics & Gynecology Update, St. Paul, MN

Information and registration: Continuing Medical Education, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; Phone 612/221-3992.

CME

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For *assistance with scheduling meetings,* please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

DECEMBER, 1986

1-5 **Team Management of Diabetes Mellitus** International Diabetes Center; Park Nicollet Medical Foundation, 5000 West 39th Street, Minneapolis, Minnesota. CONTACT: Cindy Poppitz, International Diabetes Center, 5000 West 39th Street, Minneapolis, Minnesota 55416; (612) 927-3393.

4-6 **Cardiopulmonary Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, 411 Minnesota Street, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

5 **19th Annual Symposium on Obstetrics and Gynecology** North Memorial Medical Center; North Memorial Medical Center, Robbinsdale, Minnesota. CONTACT: Frank Czerniecki, M.D., 3366 Oakdale North, Suite 601, Robbinsdale, Minnesota 55422; (612) 588-0703.

6 **Epilepsy Update** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

JANUARY, 1987

16-17 **Laser Surgery in Otolaryngology** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55406; (612) 874-5461.

30 **Detection and Diagnosis of Substance Use Disorders** St. Paul-Ramsey Medical Center; St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

30-31 **Current Concepts of Cardiology** Abbott Northwestern Hospital; Holiday Inn, Alexandria, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

January 25 - February 1, 1987 **Grenadines/Orinoco River Air/Sea Cruise** North Central Medical Conference; Aboard the Ocean Princess. CONTACT: North Central Medical Conference, 1845 Hampshire Avenue, Suite 200, St. Paul, Minnesota 55116; (612) 698-1888.

FEBRUARY, 1987

2-6 **Updates in Clinical Gastroenterology** Mayo Clinic/Mayo Foundation, Buena Vista Palace, Lake Buena Vista, Florida. CONTACT: William L. Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

6 **Burn Care Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

6-7 **Current Concepts of Cardiology** Abbott Northwestern Hospital; Sawmill Inn, Grand Rapids, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

9-13 **Practical Concepts in Rheumatology and Musculoskeletal Disease** Mayo Clinic/Mayo Foundation; Sheraton Scottsdale, Scottsdale, Arizona. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnestoa 55905; (507) 284-2085.

13 **Minnesota Dermatological Society Melanoma Seminar and Winter Quarterly Meeting** Minnesota Dermatological Society; Hennepin County Medical Center, Minneapolis, Minnesota. CONTACT: J. Corwin Vance, M.D., 701 Park Avenue South, Minneapolis, Minnesota 55415; (612) 347-2332.

16-20 **Clinical and Laboratory Hematology: Current Issues** Mayo Clinic/Mayo Foundation; Maui Marriott, Lahaina, Maui, Hawaii. CONTACT: William L. Nietz, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

19-21 **Practical Clinical Neurology** Department of Neurology, Mayo Graduate School of Medicine; Americana Resort and Conference Center, Lake Geneva, Wisconsin. CONTACT: William Nietz, 200 First Street SW, Rochester, Minnesota 55905; (507) 284-2085.

20-21 **Clinical Applications of the Nd: Yag Laser** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

21-28 **Rheumatology Symposium VI** Minnesota Medical Association Subcommittee on Rheumatic Diseases; South Seas Plantation, Captiva Island, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

26 **Advanced Cardiac Life Support Certification Course** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

MARCH, 1987

4-5 **Drug Therapy Symposium VIII** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

4-7 **Fifth Annual Critical Care Conference** St. Paul-Ramsey Medical Center, Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

13 **Psychiatry Specialty Course: DSM3** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis; CONTACT: Office of CME, Box 202 Mayo, 420 Delaware St. SE, Minneapolis, MN 55455; (612) 626-5525.

14-21 **Symposium on Sports Medicine** Minnesota Medical Association Subcommittee on Sports Medicine; Radisson Inn Maingate, (Orlando) Kissimmee, Florida. CONTACT: Minnesota Medical Association, Department of CME, 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414; (612) 378-1875.

March (continued)

20-21 **Eighth Annual Occupational Medicine Update** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

21-22 **Lasers in Gynecology and Urology** Abbott Northwestern Hospital, Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, MN 55407; (612) 874-5461.

APRIL, 1987

2-4 **Primary Care Medicine** St. Paul-Ramsey Medical Center; Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3980.

3-4 **Colorectal Problems** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street, SE, Minneapolis, Minnesota 55455; (612) 626-5525.

6-7 **Annual Ophthalmology Course: Pediatric Stabismus** CME, Medical School, University of Minnesota; Holiday Inn-Downtown, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

9-10 **Obstetrics and Gynecology Update** CME, St. Paul-Ramsey Medical Center, Holiday Inn Town Square, St. Paul, Minnesota. CONTACT: Bonnie Young, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101; (612) 221-3977.

10-11 **Eating Disorders** CME, Medical School, University of Minnesota; Earle Brown Center, St. Paul, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

20-24 **Family Practice Review: Update 1987** CME, Medical School, University of Minnesota; Radisson Hotel South, Minneapolis, Minnesota. CONTACT: Office of CME, University of Minnesota, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

25 **Minnesota Urological Society Annual Spring Seminar** Minnesota Urological Society; L'hotel Sofitel, Minneapolis, Minnesota. CONTACT: Helen Chanak, 3625 West 65th Street, Suite 120, Edina, Minnesota 55435; (612) 920-7660.

MAY, 1987

13-14 **Human Aging X** CME, Medical School, University of Minnesota; Mayo Auditorium, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525

15-16 **The Complicated Diabetic** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

17-20 **North American Primary Care Research Group** CME, Medical School, University of Minnesota; Hyatt Regency Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

19 **Gynecologic Oncology** CME, Medical School, University of Minnesota; Radisson University Hotel, Minneapolis, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

20-22 **Current Concepts in Radiation Therapy** CME, Medical School, University of Minnesota; Mayo Memorial Auditorium, Minneapolis, Minnesota. CONTACT: Office of CME, Medical School, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

29-31 **Surgery for Primary Care** CME, Medical School, University of Minnesota; Grandview Lodge, Brainerd, Minnesota. CONTACT: Office of CME, Box 202 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455; (612) 626-5525.

JUNE, 1987

25 **Advanced Cardiac Life Support Certification Course** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

JULY, 1987

17-18 **Laser Surgery in Otolaryngology** Abbott Northwestern Hospital; Abbott Northwestern Hospital, Minneapolis, Minnesota. CONTACT: Sarah S. Ventres, Abbott Northwestern Hospital, 800 East 28th Street, Minneapolis, Minnesota 55407; (612) 874-5461.

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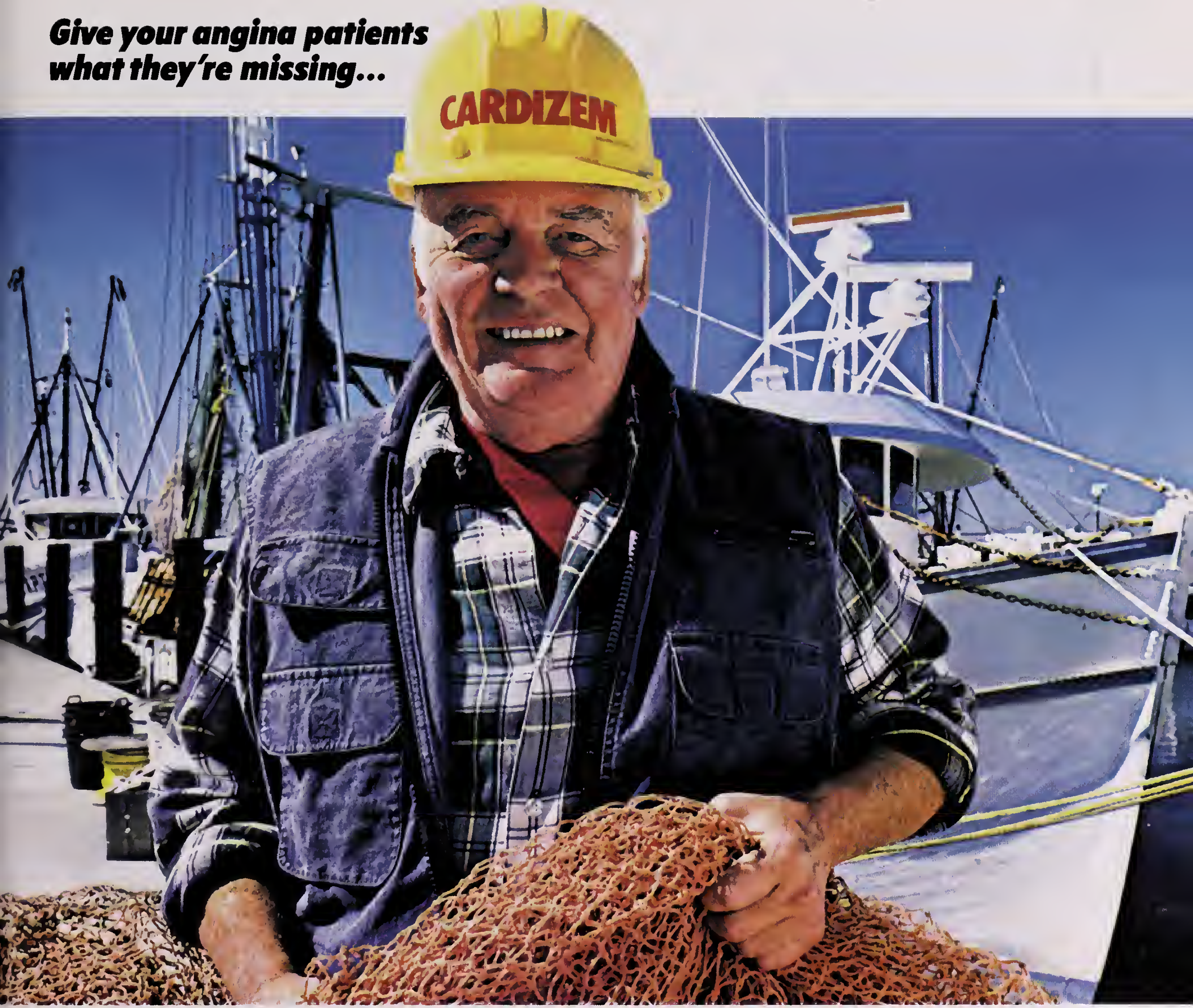

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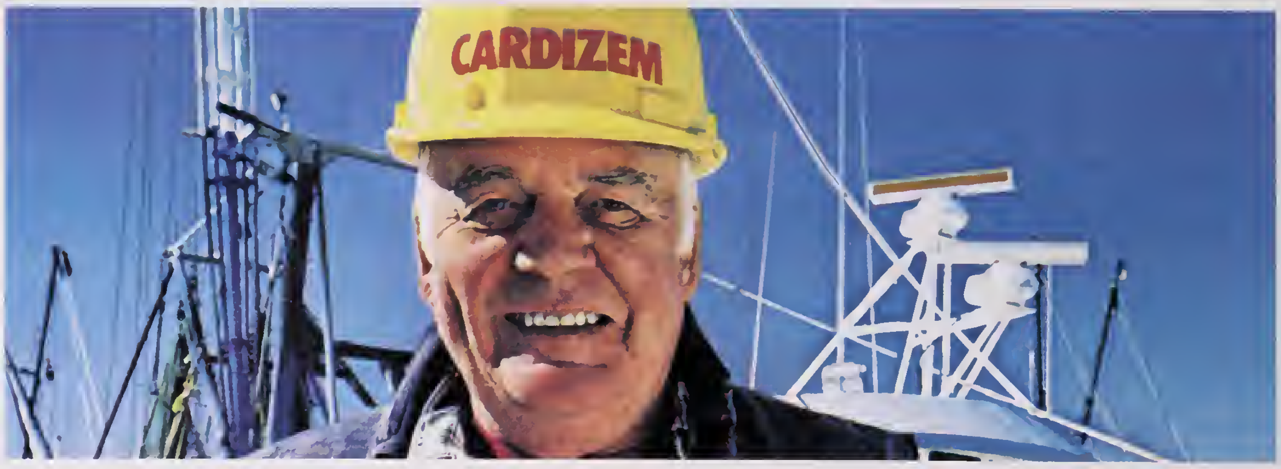
- **Proven efficacy when used alone in angina**[1]
- **Compatible with other antianginals**[2,3]*
- **A safe choice for angina patients with coexisting hypertension, asthma, COPD, or PVD**[4,5]

***See Warnings and Precautions.**

Please see brief summary of prescribing information on the next page.



CARDIZEM® diltiazem HCl/Marion

FEW SIDE EFFECTS IN ANTIANGINAL THERAPY

60 mg tid or qid

Brief Summary
Professional Use Information

CARDIZEM®
(diltiazem HCl) 30 mg and 60 mg Tablets

CONTRAINDICATIONS

CARDIZEM is contraindicated in (1) patients with sick sinus syndrome except in the presence of a functioning ventricular pacemaker, (2) patients with second- or third-degree AV block except in the presence of a functioning ventricular pacemaker, and (3) patients with hypotension (less than 90 mm Hg systolic).

WARNINGS

1. **Cardiac Conduction.** *CARDIZEM prolongs AV node refractory periods without significantly prolonging sinus node recovery time, except in patients with sick sinus syndrome. This effect may rarely result in abnormally slow heart rates (particularly in patients with sick sinus syndrome) or second- or third-degree AV block (six of 1,243 patients for 0.48%). Concomitant use of diltiazem with beta-blockers or digitalis may result in additive effects on cardiac conduction. A patient with Prinzmetal's angina developed periods of asystole (2 to 5 seconds) after a single dose of 60 mg of diltiazem.*
2. **Congestive Heart Failure.** *Although diltiazem has a negative inotropic effect in isolated animal tissue preparations, hemodynamic studies in humans with normal ventricular function have not shown a reduction in cardiac index nor consistent negative effects on contractility (dp/dt).*

   Experience with the use of CARDIZEM alone or in combination with beta-blockers in patients with impaired ventricular function is very limited. Caution should be exercised when using the drug in such patients.
3. **Hypotension.** *Decreases in blood pressure associated with CARDIZEM therapy may occasionally result in symptomatic hypotension.*
4. **Acute Hepatic Injury.** *In rare instances, significant elevations in enzymes such as alkaline phosphatase, CPK, LDH, SGOT, SGPT, and other symptoms consistent with acute hepatic injury have been noted. These reactions have been reversible upon discontinuation of drug therapy. The relationship to CARDIZEM is uncertain in most cases, but probable in some. (See PRECAUTIONS.)*

PRECAUTIONS

General. *CARDIZEM (diltiazem hydrochloride) is extensively metabolized by the liver and excreted by the kidneys and in bile. As with any new drug given over prolonged periods, laboratory parameters should be monitored at regular intervals. The drug should be used with caution in patients with impaired renal or hepatic function. In subacute and chronic dog and rat studies designed to produce toxicity, high doses of diltiazem were associated with hepatic damage. In special subacute hepatic studies, oral doses of 125 mg/kg and higher in rats were associated with histological changes in the liver which were reversible when the drug was discontinued. In dogs, doses of 20 mg/kg were also associated with hepatic changes, however, these changes were reversible with continued dosing.*

Drug Interaction. *Pharmacologic studies indicate that there may be additive effects in prolonging AV conduction when using beta-blockers or digitalis concomitantly with CARDIZEM. (See WARNINGS.)*

Controlled and uncontrolled domestic studies suggest that concomitant use of CARDIZEM and beta-blockers or digitalis is usually well tolerated. Available data are not sufficient, however, to predict the effects of concomitant treatment, particularly in patients with left ventricular dysfunction or cardiac conduction abnormalities. In healthy volunteers, diltiazem has been shown to increase serum digoxin levels up to 20%.

Carcinogenesis, Mutagenesis, Impairment of Fertility. *A 24-month study in rats and a 21-month study in mice showed no evidence of carcinogenicity. There was also no mutagenic response in in vitro bacterial tests. No intrinsic effect on fertility was observed in rats.*

Pregnancy. *Category C. Reproduction studies have been conducted in mice, rats, and rabbits. Administration of doses ranging from five to ten times greater (on a mg/kg basis) than the daily recommended therapeutic dose has resulted in embryo and fetal lethality. These doses, in some studies, have been reported to cause skeletal abnormalities. In the perinatal/postnatal studies, there was some reduction in early individual pup weights and survival rates. There was an increased incidence of stillbirths at doses of 20 times the human dose or greater.*

There are no well-controlled studies in pregnant women, therefore, use CARDIZEM in pregnant women only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers. *Diltiazem is excreted in human milk. One report suggests that concentrations in breast milk may approximate serum levels. If use of CARDIZEM is deemed essential, an alternative method of infant feeding should be instituted.*

Pediatric Use. *Safety and effectiveness in children have not been established.*

ADVERSE REACTIONS

Serious adverse reactions have been rare in studies carried out to date, but it should be recognized that patients with impaired ventricular function and cardiac conduction abnormalities have usually been excluded.

In domestic placebo-controlled trials, the incidence of adverse reactions reported during CARDIZEM therapy was not greater than that reported during placebo therapy.

The following represent occurrences observed in clinical studies which can be at least reasonably associated with the pharmacology of calcium influx inhibition. In many cases, the relationship to CARDIZEM has not been established. The most common occurrences as well as their frequency of presentation are: edema (2.4%), headache (2.1%), nausea (1.9%), dizziness (1.5%), rash (1.3%), asthenia (1.2%). In addition, the following events were reported infrequently (less than 1%):

Cardiovascular:	*Angina, arrhythmia, AV block (first degree), AV block (second or third degree — see conduction warning), bradycardia, congestive heart failure, flushing, hypotension, palpitations, syncope.*
Nervous System:	*Amnesia, gait abnormality, hallucinations, insomnia, nervousness, paresthesia, personality change, somnolence, tinnitus, tremor*
Gastrointestinal:	*Anorexia, constipation, diarrhea, dysgeusia, dyspepsia, mild elevations of alkaline phosphatase, SGOT, SGPT, and LDH (see hepatic warnings), vomiting, weight increase*
Dermatologic:	*Petechiae, pruritus, photosensitivity, urticaria*
Other:	*Amblyopia, dyspnea, epistaxis, eye irritation, hyperglycemia, nasal congestion, nocturia, osteoarticular pain, polyuria, sexual difficulties*

The following postmarketing events have been reported infrequently in patients receiving CARDIZEM: alopecia, gingival hyperplasia, erythema multiforme, and leukopenia. However, a definitive cause and effect between these events and CARDIZEM therapy is yet to be established.

Issued 7/86

See complete Professional Use Information before prescribing.

References: 1. *Pepine CJ, Feldman RL, Hill JA, et al: Clinical outcome after treatment of rest angina with calcium blockers: Comparative experience during the initial year of therapy with diltiazem, nifedipine, and verapamil. Am Heart J 1983; 106(6):1341-1347.* **2.** *Shapiro W: Calcium channel blockers: Actions on the heart and uses in ischemic heart disease. Consultant 1984;24(Dec):150-159.* **3.** *Johnston DL, Lesoway R, Humen DP, et al: Clinical and hemodynamic evaluation of propranolol in combination with verapamil, nifedipine and diltiazem in exertional angina pectoris: A placebo-controlled, double-blind, randomized, crossover study. Am J Cardiol 1985;55:680-687.* **4.** *Cohn PF, Braunwald E: Chronic ischemic heart disease, in Braunwald E (ed): Heart Disease: A Textbook of Cardiovascular Medicine, ed 2. Philadelphia, WB Saunders Co, 1984, chap 39.* **5.** *Schroeder JS: Calcium and beta blockers in ischemic heart disease: When to use which. Mod Med 1982;50(Sept):94-116.*

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Opportunity For Physician with interest in Sports Medicine to provide medical consultation to a physical fitness program for public safety employees. Duties include performing periodic medical examinations, monitoring and interpreting graded exercise tests, interpreting spirograms, and performing limited administrative duties. Contact: David A. Paulson, M.D., at (612) 292-7726. (R)

Medical Practice Sales and Appraisals: We specialize in the valuation and selling of medical practices. If interested in buying or selling a medical practice, contact our Brokerage Division at The Health Care Group, 400 GSB Building, Bala Cynwyd, Pennsylvania 19004; (215) 667-8630. (R)

Orthopedic Opportunity to join existing three-man Board Certified orthopedic group. Opening July 1987. Send resume or CV to: Clinic of Orthopedic Surgery, Chartered, 73 East First Street, Fond du Lac, Wisconsin 54935. 3-12/86

Ophthalmologist, Internist-Cardiologist, Family Practice positions available with the Mankato Clinic, a 35-doctor multispecialty group practice in South-central Minnesota with a trade area population of 150,000. Salary first year, incentive thereafter, with full range of benefits and liberal time off. For more information, call R.F . Roskens, Administrator, or Dr. B.C. McGregor (507) 625-1811 or write: 501 Holly Lane, Mankato, Minnesota 56001. (R)

Psychiatrist: BC/BE psychiatrist needed by our 150-member multispecialty medical staff and hospital in St. Cloud, Minnesota. Outstanding opportunity to establish a private practice with immediate income of $72,000 for 15 hrs/wk as medical director of hospital-based outpatient mental health program. An active 53-bed mental health unit psychiatric staff consisting of 3 psychiatrists, 2 psychologists, social workers, mental health nurses, and ancillary staff provides excellent clinical support. St. Cloud has three area colleges and an excellent independent and parochial school system. Easy one-hour freeway driving to Minneapolis/St. Paul provides outstanding cultural opportunities. St. Cloud is an ideal location for private practice and raising a family in a small town environment. Respond with CV or call collect to: R.J. Cumming, M.D., Director of Medical Affairs, St. Cloud Hospital, 1406 North 6th Avenue, St. Cloud, Minnesota 56301; (612) 255-5626. 6-3/87

Wanted: Board Eligible/Certified Internist for primary care clinic near 75-bed hospital. Ideal community of 20,000 with a business area of 60,000 centered in a four-season recreational area. Specialty medical services available locally. Incentive earnings plan, insurance, and retirement plans available. Contact: Dennis Knudson, Administrator, LP Medical Clinic, 820 9th Street North, Virginia, Minnesota 55792. 5-2/87

Primary Care Physician: Opportunity for internist or family practitioner in north suburban area. Contact: Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, Minnesota 55429; (612) 533-8666. 3-12/86

Family Practice: Hastings Family Practice, PA, is looking for a female BC/BE FP to practice with four established residency trained Ab/FP physicians. Clinic is attached to hospital complex. Send CV to: D.R. Eckes, M.D., 1280 Ninninger Road, Hastings, Minnesota 55033; or call (612) 437-8666. 3-12/86

Choice Downtown Medical Office to Share: Ideal for Internist or FP; (612) 224-7900. 3-12/86

St. Peter, Minnesota: Available immediately. Position of senior staff physician to work with progressive and forward-looking staff and administration to meet the medical needs of the patients at St. Peter Regional Treatment Center. JCAH accredited. Delightful setting in the heart of the

Minnesota River Valley. University town of 10,000, ten minutes from Mankato, and one hour from the Twin Cities. Salary range in high-60s to 70s for BC/BE according to experience with excellent fringe benefit package and an opportunity for expanding income through minimal call. An AA/EOE employer. For further information contact: S.K. McHutchison, M.D., Clinical Director, St. Peter State Hospital, 100 Freeman Drive, St. Paul, Minnesota 56082; (507) 931-7707. (R)

Family Physician wanted, board certified or eligible, to join three young family physicians in a growing family practice group. New facility. Northfield is a small attractive college town (St. Olaf and Carleton) and is less than one hour from the Twin Cities and Rochester. Contact: Kenneth Sansome, M.D., David Larson, M.D., or Mark Mellstrom, M.D., Family Physicians of Northfield, 505 West Woodley, Northfield, Minnesota 55057; (507) 663-1261. (R)

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Internist needed for a busy, two-member practice in a community of 40,000 near Minneapolis, Minnesota. Competitive first year salary with incentive benefits and early partnership. Contact: Diagnostic Center, 304 Belle Avenue, Mankato, Minnesota 56001; (507) 388-1655. 6-2/87

Green Bay, Wisconsin: 27-physician multispecialty group seeking BC/BE physicians in the following specialties: Family Practice, Ophthalmology, ENT, Dermatology, Plastic Surgery, Radiology, OB-GYN, Internal Medicine, and Pediatrics. Green Bay is a progressive community with an easy lifestyle, ample outdoor activities, excellent schools, and cultural activities. The Clinic offers competitive salary and excellent fringe benefits. Interested physicians please contact: W.J. Mommaerts, Administrator, West Side Clinic, sc, PO Box 19070, Green Bay, Wisconsin 54307-9070. 4-3/87

General Internist: We are in need of a qualified internist, preferred board certified, to cover expanding service area. Sandstone Area Hospital/Nursing Home is a 30-bed acute and 86-bed long-term care facility with a clinic loacted next to the facility staffed by two full-time physicians. Sandstone is located in Northeast Minnesota's heartland, providing rich recreational activities. For more information, call/write: James G. Blum, Administrator, Sandstone Area Hospital, 317 Court, Sandstone, Minnesota 55072; (612) 245-2212. (R)

Family Practitioner needed to join a progressive 11-physician group. Liberal fringes and financial package. Thirty miles from metropolitan Minneapolis/St. Paul. Contact: R.M. Hammer, M.D., River Falls, Wisconsin 54022; (715) 425-6701 or (612) 436-8809. 4-12/86

General Internist to join our group of five family practitioners, one obstetrician, and one surgeon. We are located in a central Minnesota community of 9,000. Most aspects of internal medicine are available to this already established practice, including gastroscopy and invasive cardiovascular monitoring. Competitive salary with option to buy into group after one year. For information contact: Michael Neudecker, M.D., Medical Center PA; 209 First Street SE, Little Falls, Minnesota 56345; (612) 632-6611. (R)

Urologist Wanted: Board certified-board eligible needed to join a well established downtown practice in Minneapolis. Send CV to: Loren R. Keldahl, M.D., 825 South 8th Street, Suite 402, Minneapolis, Minnesota 55404. 4-12/86

Physician Opportunities available in suburban area near Minneapolis/St. Paul for family practice ob/gyn, internal medicine. New clinic venture with hospital. Large service area with beautiful communities, lakes, recreation. Write: Minnesota Medicine (800), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

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Jim (612) 333-8361. (R)

Family Physician to join group of six board certified family practitioners and one board certified general surgeon. Liberal vacation and educational allowances. $50,000 salary first year with incentive bonus and full membership after one year. Blue Earth is a community of 4,000 in Southern Minnesota with a drawing area of 25,000. 43-bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology, and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, Minnesota 56013; phone (507) 526-7371; personal phone (507) 526-3177. Marjeane Werner, Clinic Administrator; phone (507) 526-7371; personal phone (507) 854-3682. (R)

Emergency Medicine: Emergency physicians needed to staff clinic and hospital emergency room. Multispecialty group located in ideal area 90 minutes from Minneapolis/St. Paul, excellent schools, etc. 132-bed hospital has an active educational program including ACLS. Contact: Richard W. Golly, Austin Medical Clinic, PA, 101 NW 14th Street, Austin, Minnesota 55912; (507) 433-7351. (R)

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Arizona-based Physician Recruitment firm has opportunities coast to coast. "Professionals working with Professionals." Over 13 years' experience. Call: (602) 795-7474; or send CV to: Mitchell & Associates, Inc., 2761 North Country Club Road, Suite 202, Tucson, Arizona 85716. (R)

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Wanted: Family Practitioner—Ob/Gyn Group practice, central Minnesota. Starting salary $55,000. Write: Minnesota Medicine (755), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. (R)

Ob-Gyn needed for busy, modern practice with one female board certified OB-GYN in suburban St. Paul. Extremely flexible hours to accommodate personal lifestyle. Generous benefit package plus liberal vacation time and paid continuing education. Salary first year. Early partnership; (612) 455-3200. (R)

Family Practice, Internal Medicine, and General Surgery positions available at the Faribault Clinic. The Clinic is composed of eight family practitioners, two internists, and a general surgeon. Faribault is a community of 17,000 located 50 miles south of Minneapolis. Contact: Ken Smith, Administrator, Faribault Clinic, 924 NE First Street, Faribault, Minnesota 55021; (507) 334-3921. (R)

Family Practice: Three-man family practice clinic in Central Minnesota is looking for additional family practitioner; BC/BE preferred. Clinic is attached to 96-bed hospital. Area is gateway to lake country and 90-minute drive to Twin Cities. For information, please call: O.E. Wiger, M.D., Family Clinic PA, 808 SE 3rd Street, Little Falls, Minnesota 56345; (612) 632-2301 office, or (612) 632-9325, home. 6-12/86

Family Physician needed to replace retiring partner in thriving 3-FP full-service practice in Starbuck, Minnesota, on the state's 13th largest lake. Good hunting and fishing. Modern 9-year-old hospital. Twenty miles to university campus. Call or write: Robert Bosl, M.D., Starbuck Clinic, PA, Starbuck, Minnesota 56381; (612) 239-2231. (R)

FAMILY PHYSICIAN/EMERGENCYROOM: Full-time salary working weekends, primarily emergency room. Flexibility available. Falls Medical Center, PA, 105 Shorewood Drive, International Falls, Minnesota 56649. Please contact: Douglas A. Johnson, M.D., or A. Mare Gorden, M.D., at (218) 283-9431 for more information. (R)

ORTHOPEDIC SURGEON BC/BE 435,000 gross established practice available in multispecialty clinic of 16 board certified physicians in family practice, internal medicine, pediatrics, orthopedics, general surgery, and emergency medicine. Associate physician regular visits in neurology, oncology, otolaryngology, pathology, and radiology. Other specialties in town are ophthalmology and urology. Historic city of 15,000 located 90 minutes south of Minneapolis metro area, 30 minutes from Mankato State University. Well-balanced economy between Kraft, 3M, Pantasote, AMPI, and agri-businesses. Three excellent school systems in addition to a college. Write: Minnesota Medicine (803), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. 4-2/87

FAMILY PHYSICIAN WANTED for 5-physician partnership in northern suburb of the Twin Cities. Competitive salary and benefits. Opportunity to contribute to future direction of the practice. Contact: James Rusin, M.D., East Main Clinic, 850 East Main Street, Anoka, Minnesota 55303; (612) 421-7070. 3-1/87

DIRECTOR OF MEDICAL SERVICES: Are you ready for a change from Clinical Medicine? We have a full-time position available in Insurance Medicine. Primary duties involve answering medical questions from underwriters or claims reviewers, interpreting ECGs and chest X-rays, and doing occasional physical examinations. Excellent benefits, regular hours, and weekends free. Internal medicine specialty preferred. If interested, send a resume and salary history to: The Medical Department, PO Box 1143, Minneapolis, Minnesota 55440. 2-12/86

FAMILY PRACTITIONER AND GENERAL INTERNIST to join 7-physician clinic in Cloquet, Minnesota, a community of 14,000 (30,000 service area), located 20 minutes from Duluth-Superior. The clinic facility is located one block from modern, well-equipped hospital. Cloquet enjoys a stable economy (forest products). Additionally, our community is noted for its excellent school system. First-year salary guarantee, paid malpractice, health and disability insurance, vacation, and study time. Contact: John Turonie, Administrator, Raiter Clinic, Ltd., 417 Skyline Boulevard, Cloquet, Minnesota 55720; (218) 879-1271. (R)

PEDIATRICIAN: Exciting opportunity to join male and female pediatricians in practice consisting of both primary and consultative pediatrics. Individuals interested in a leadership position to head the Department of Pediatrics, Board Eligible or Certified and with neonatology expertise should apply. Practice is with a 50+ physician multispecialty group located in Minneapolis suburban area (15 minutes from downtown). Interested applicants contact: Tom Behrend, Columbia Park Medical Group, 6200 Shingle Creek Parkway, Suite 480, Brooklyn Center, Minnesota 55430; (612) 560-3450. 3-1/87

OB/GYN:Young female and male seeking a third physician to join us in our busy OB/GYN practice. We are a 54-physician multispecialty clinic in the suburban Minneapolis area. Practice offers utilization of one hospital, full day off during week, and opportunity to chair clinic OB department. Must be Board Certified or Board Eligible. Feel free to contact: Dr. Lori Radke (612) 559-7432 or send CV to: Tom Behrend, Columbia Park Medical Group, 6200 Shingle Creek Parkway, Suite 480, Brooklyn Center, Minnesota 55430; (612) 560-3450. 3-1/87

INTERNAL MEDICINE: Interstate Medical Center is seeking general internist, BC/BE to join 27-physician multispecialty group. Contact: John Walsh, M.D., Interstate Medical Center, PA, Highway 61 West, Red Wing, Minnesota 55066; (612) 388-3503. 4-2/87

FAMILY PRACTITIONER board certified or eligible to join 11-physician, expanding multispecialty practice in northern Wisconsin. Clinic adjoins JCAH hospital. Rural location with abundant outdoor recreational opportunities, small four-year college. Excellent salary and benefits. Call collect: (715) 532-6651 or send CV with names of references to: Marshfield Clinic - Ladysmith Center, Howard T. Chatterton, M.D., 906 College Avenue West, Ladysmith, Wisconsin 54848. 3-1/87

SUBURBAN FP GROUP —SHARE affiliate—seeks associate to service rapid practice growth. Competitive salary and benefits. Unique opportunity to establish your practice. Contact: Gloria M. Vierling, Sundance Medical Clinics, Ltd., 323 Naumkeag Street, PO Box 9, Shakopee, Minnesota 55379; (612) 445-6440. (R)

Family Practitioner BC/BE to join group of six board certified family practitioners and a board certified general surgeon. We offer liberal educational and vacation allowances, excellent benefit package, guaranteed minimum salary first six months, with production bonus and membership opportunity. Montevideo is located in west-central Minnesota (population 5,600) with a draw area of 25,000. Our clinic is attached to a modern 35-bed hospital, both new in the late 70s. Please contact: Norman Hagberg, M.D., Montevideo Clinic PA, 908 North 11th Street, Montevideo, Minnesota 56265: (612) 269-6435, or Jim Noble, Administrator, Montevideo Clinic PA, (612) 269-6435. 3-1/87

For Sale —Family practice with or without clinic. County seat community. Excellent school, hospital, nursing home, nursing staff. Clinic—6 exam rooms, X-ray, lab, etc. Will finance and assist in establishing new M.D. Contact: H.A. Knoche, M.D., Gaylord Clinic, Ltd., 315 4th Street, Box 267, Gaylord, Minnesota 55334; (612) 237-2528. 6-4/87

Family Practice: Multispecialty group is seeking 2 family practitioners, BC/BE, to join 2 physicians in our Zumbrota branch office. Generous salary and outstanding fringe benefits. Contact: John Walsh, M.D., Interstate Medical Center, PA, Highway 61 West, Red Wing, Minnesota 55066; (612) 388-3503. 4-2/87

FP/GP Locum Available for Work Lic. Minnesota, Wisconsin, SD, ND, Colorado, Utah, Missouri. Contact: Dr. Olin, 21450 Excelsior Boulevard, Excelsior, Minnesota 55331; (612) 474-1050. (R)

Gaylord Community Hospital is a seeking a family physician to serve its community of 2,000 population. 65-year-old physician retiring, and downtown clinic is for sale. Also have clinic attached to hospital. 32-bed hospital, 58-bed nursing home. Guaranteed fist year salary plus benefits. Contact: Richard Kons, Administrator (612) 237-2905, or write: PO Box 386, Gaylord, Minnesota 55334. 2-1/87, 3/87

Emergency Physician: Waconia Emergency Physicians Group seeks part-time or full-time EM physician. 110-bed hospital located 30 miles from Minneapolis. Contact: Rob Welch, M.D., 500 South Maple, Waconia, Minnesota 55387; (612) 442-2191 or 448-7426. 2-12/86

Writing Assistance for medical journal articles, patient information brochures, marketing brochures. Ten years of experience in health care writing. Call Elaine Lampert, Freelance Writer (612) 447-5883. (R)

Family Practice: St. Peter Clinic, Ltd., is looking for a seventh BE/BC family physician. Contact: Doug Olmanson, M.D., 622 Sunrise Drive, St. Peter, Minnesota 56082; or call (507) 931-2110. 1-12/86

Innovative? Independent? Family Practice position (Board Eligible) available with a well-established practice of over 30 years. Including pediatrics, adult medicine, hospital care, providing personal care close to North Memorial Medical Center. We are looking for a physician with strong interests in women's health care to complement new programs in wellness, mental health, physical therapy, and senior programs. Obstetrics is optional, hours flexible. Early partnership available. For further information please contact: Harry S. Krulewitch, M.D., 5840 North Lilac Drive, Brooklyn Center, Minnesota 55430; (612) 561-2520. 3-2/87

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Primary Care Physicians: one or two to take over primary care practice and facility with doctors offices, exam rooms, laboratories and X-ray room, and minor surgery room. Clinic at western border of Minneapolis, Minnesota, and western suburb with large marketing area and only four short blocks from North Memorial Medical Center. Respond to: R.J. Rotenberg, M.D., 2512 West Broadway, Minneapolis, Minnesota 55411; (612) 529-9141. 1-12/86

Family Practitioner/WI: BC/BE to join 23-physician multispecialty group. Progressive hospital equipped with CT scanner. Service population of 60,000-80,000. University community. Reply:

Administrator, 2501 Main Street, Stevens Point, Wisconsin 54481; or call Collect (715) 344-4120. 3-2/87

EMERGENCY MEDICINE: for emergency physician who possesses excellent clinical and trauma skills within a group of 7 Emergency Room physicians. Located in a beautiful northwest Wisconsin area. Position opening July 1987. Please send CV to: Dr. M. Jaghlit, 900 West Clairemont Avenue, Eau Claire, Wisconsin 54701; or call (715) 839-4404. *3-2/87

CAMP PHYSICIAN: Summer opportunity. Spend up to nine weeks (minimum of four weeks) in outstanding girls' camp in Maine. Staff of three RNs and Nurse's Aide. Pediatrician or family practice preferred. Excellent salary and housing. Call: (301) 653-3082 days, (301) 363-6369 evenings or weekends. *1-12/86

EMERGENCY MEDICINE PHYSICIAN: Ramsey Clinic, a University-affiliated multispecialty clinic located in St. Paul, Minnesota, seeks a board certified or board eligible Emergency Medicine Physician to join our 160-physician group practice. Through our association with St. Paul-Ramsey Medical Center, you will be providing clinical services in a large-volume Emergency Room. Teaching and research opportunities are also available. Salary is commensurate with experience and excellent fringe benefits are offered as part of this opportunity. For further information and confidential consideration, send your CV in confidence to: Wayne F. Hass, M.D., Associate Chief, Department of Emergency Medicine, Ramsey Clinic, 640 Jackson Street, St. Paul, Minnesota 55101. An Equal Opportunity Employer. *2-1/87

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EMERSON IRON LUNG, complete, good working order. External Chest Ventilator, complete. Best offer. Contact: E.R. Lucier, M.D., RR 8, Box 91B, Mankato, Minnesota 56001. 1-12/86

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BOARD CERTIFIED INTERNIST, ONCOLOGIST, OR GASTROENTERIOLOGIST (willing to do General Internal Medicine) to join expanding group of Internists with offices in downtown Minneapolis and western suburb. Excellent benefits and earning potential. Opportunity to work with young academically motivated group. Please contact: Dr. R.W. Kaufman or Dr. J.P. Kieley; (612) 339-7171. (R)

ESTABLISH YOUR PRACTICE in a multispecialty setting with freedom to practice traditional family practice, including obstetrics and pediatrics, and/or develop special interests in geriatrics, sports medicine, trauma, or occupational medicine. Associate with the oldest and largest staff-model HMO in the Midwest. Highly competitive guaranteed salary with minimum starting salary in high 40s with general benefits package. Several locations in Minneapolis/St. Paul metropolitan area available. For further information contact: Gary Freeman, M.D., Chairman, Department of Family Practice, GROUP HEALTH, INC., 2829 University Avenue SE, Minneapolis, Minnesota 55414 or call (612) 623-8444. 1-12/86

MEDICAL JOURNAL EDITOR: Physician to be Editor-in-Chief of an established medical journal directed to the clinical interests of primary care physicians. Primary responsibilities would be solicitation/acquisition of manuscripts, planning/balancing editorial content, managing staff of editors of a highly professional peer-reviewed journal. Experience as editor and writer for medical journal preferred. Negotiable salary depending on qualifications and experience plus excellent fringe benefits. Equal opportunity employer. Please submit a CV to: Minnesota Medicine, (804), 2221 University Avenue SE, Suite 400, Minneapolis, Minnesota 55414. *1-12/86

PEDIATRICIAN: Excellent opportunity to join four pediatricians in a very active practice. Growing community, excellent hospital with teaching opportunities available. Close to Milwaukee. Contact: John R. Gay, M.D., 1111 Delafield

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Full/Associate Professor Chair, Maternal and Child Health: The University of Minnesota School of Public Health, Division of Human Development and Nutrition, is seeking a principal investigator for the Maternal and Child Health Training Grant and to head the MCH major. This tenured position is a permanent 9 or 12 month (negotiable) appointment at the Full or Associate Professor level.

The successful candidate must have an earned Doctor of Medicine degree with a Master's Degree in Public Health/Maternal and Child Health, be established as principal investigator on sponsored research with a record of research achievements and publications in the area of Maternal and Child Health, have documented competencies in Maternal and Child Health and quantitative sciences, have doctoral-level teaching and advising experience and strong organizational and administrative skills.

Responsibilities include: establishing a research program in maternal and child health, securing and maintaining extramural funding, fostering collaborative research with maternal and child health components, teaching a minimum of two graduate-level courses in maternal and child health, advising and involving students in research, contributing to administrative and service activities of the division, school, and University.

Eight years professional experience required for the associate, 10 years for the full professor level. Salary is negotiable. Application deadline: February 1, 1987, for appointment on or after July 1, 1987. Send CV, cover letter overviewing academic interests and research, teaching, and administrative experience, and names and addresses of three references to: Robert Blum, M.D., Ph.D., Chair, Search Committee, c/o Darleen Kenyon, Maternal and Child Health, Box 197 Mayo, 420 Delaware Street SE, Minneapolis, Minnesota 55455. The University of Minnesota is an equal opportunity employer and specificially invites and encourages applications from women and minorities. 1-12/86

Mora Medical Center seeks Board Eligible or certified family physician or internist for group of seven family practitioners and one internist. Salary for two years then partnership. Sixty-two bed hospital in a town of 3,000 with service of 10,000. Located in central Minnesota only 65 miles north of Twin Cities. Contact Mark Hruby, 224 7th Street, Mora, Minnesota 55051, (612) 679-1313. 1-12/86

General Surgeon: Chisago Health Services is seeking a board certified surgeon to join its 13 physicians. CHS operates Medical Centers in Chisago City, Wyoming, and North Branch and the Chisago Lakes Hospital. The Chisago Lakes area is currently located 35 miles northeast of the Twin Cities. Excellent salary and benefits. Contact: Scott Wordelman, President, Chisago Health Services, Chisago City, Minnesota 55013. (612) 257-2500. 4-3/87

Director of Anesthesiology/MedicalDirector: Modern fast-growing surgical facility seeks BC/BE Anesthesiologist for this dynamic Twin Cities position involving 80% direct services and 20% supervisory and administrative. Attractive days and hours: no evenings, no weekends, no call. Salary guarantee of $75,000 + bonus of up to $20,000 + excellent benefits that include paid malpractice + negotiable relocation expenses + client organization will pay our agency service fee. Please write or call collect in confidence: (612) 926-6584, Jerry Neren, Recruiter, MedSearch Corp., Southdale Medical Building, 6545 France Avenue South, Edina, Minnesota 55435. 1-12/86

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Unusual Opportunity to practice 50-100% time at NOKOMIS CLINIC in south Minneapolis with an innovative and academically-oriented group. Contact Greg Gepner or Leif Solberg; (612) 827-3871. 1-12/86

General Internist: Marshfield Clinic, one of the nation's largest multispecialty private groups, is seeking several board certified/board eligible General Internal Medicine specialists to join its expanding 18-member section. Internal medicine residency program, University affiliation, research foundation, and large regional referral base contribute to a very stimulating environment. Unique big-city medicine opportunity in a family-oriented rural setting. Please send CV to: John P. Folz, Director, Marshfield Clinic, 1000 North Oak Avenue, Marshfield, Wisconsin 54449 or call collect (715) 387-5181. 3-2/87

Growing West Suburban Lake Minnetonka Clinic adding one full-time Internal Medicine Physician. Multispecialty: Family Practice, Pediatrics, Surgery, Urology, Optometry, Internal Medicine, OB/GYN, Orthopedics, Ophthalmology. 19-physician clinic, three offices. Quiet, rural area allowing easy access to downtown Minneapolis. Immediate interviewing. Forward CV to: Mound Clinic, Ltd., 2200 Commerce Boulevard, Mound, Minnesota 55364, Attn: Diane Theis; (612) 472-1144. 2-1/87

The University of Minnesota School of Dentistry invites applications for part-time, nonregular faculty for consultative diagnositic and treatment planning services in specialty clinics. MD required, with training and experience in otolaryngology or reconstructive surgery in cleft palate patient care. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities. Send resume (indicating specialty or area(s) or clinical expertise) by 6/30/87 to: Dean Richard P. Elzay, University of Minnesota School of Dentistry, 515 Delaware Street SE, Minneapolis, Minnesota 55455. 1-12/86

Family Practice: Associate needed to join two family physicians in Caledonia, Minnesota. Hospital privileges at local hospital, and St. Francis Medical Center, 20 miles east in La Crosse, Wisconsin. Contact: Phil Peterson, collect (414) 784-3258. 1-12/86

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Executive Director
The Duluth Clinic, Ltd.
400 East Third Street
Duluth, Minnesota 55805

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Cover Photograph

10° Below

Scott W. Sharkey, M.D., took the cover photograph one very cold daybreak from Madeline Island, looking east over Lake Superior. He used a Pentax camera with a 50 mm lens and Kodachrome 64 film.

Dr. Sharkey is an assistant professor of medicine at the University of Minnesota and attending physician in the Cardiology Section at Hennepin County Medical Center.

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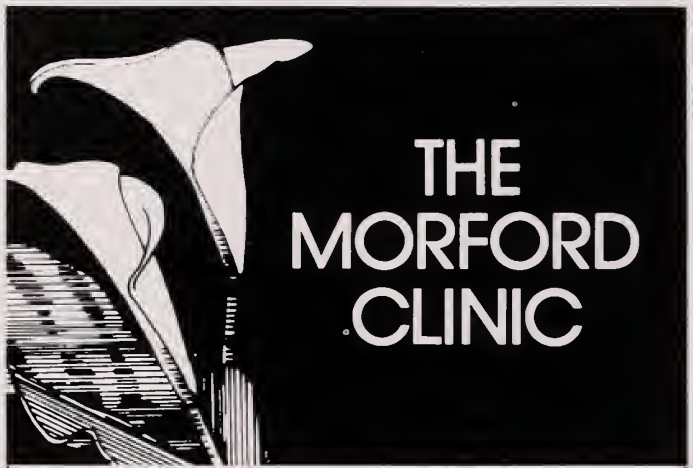

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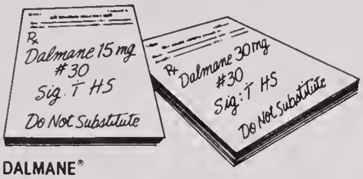

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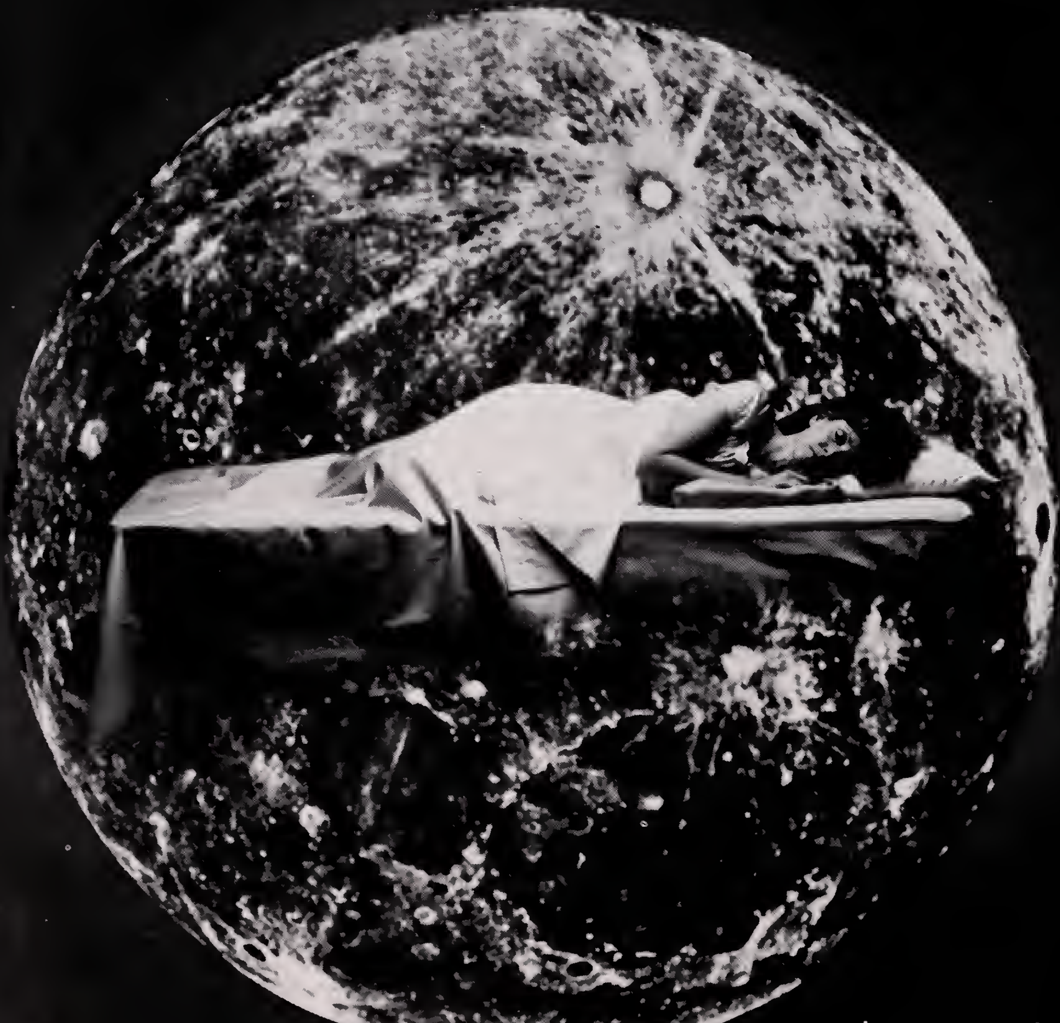

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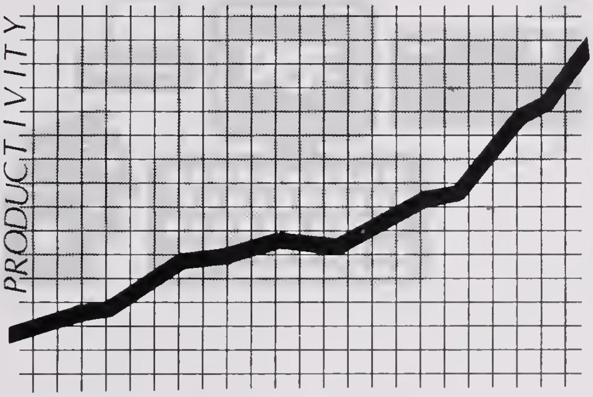

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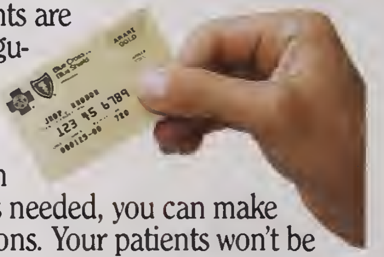

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